

THE IRON AGE

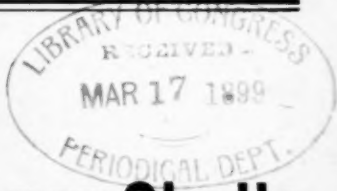
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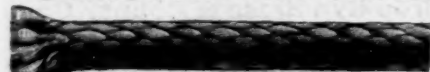


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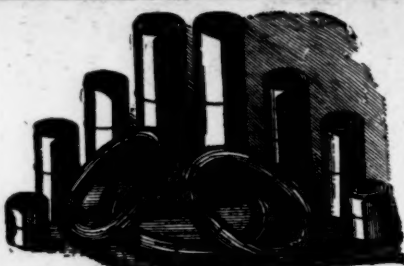
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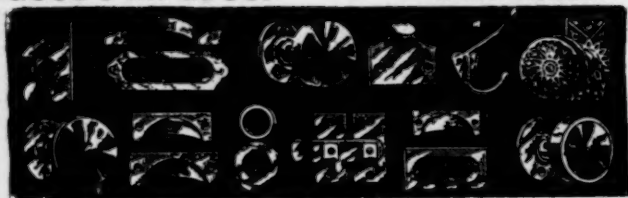
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THE IRON AGE.

THURSDAY, MARCH 16, 1899.

The Farmer Combination Lathe and Grinding Tool.

The attachment illustrated consists of a yoke with a shank whereby the yoke may be secured to the tool post of an ordinary lathe. In each branch of the yoke is a taper hole fitted with a split box which is provided with nuts for adjustment and for holding it in correct position. Supported by the box is a rotating sleeve carrying a pulley located between the branches of the yoke. The sleeve is splined to a shaft having one end arranged to carry the cutting tool and having at the other end a

The tool will also do turning, boring (either straight or taper) milling and drilling.

Some of the applications of the attachment, which is made by J. E. & A. J. Farmer of Hartford, Conn., are shown in the accompanying drawings. The first engraving illustrates grinding a taper reamer with the center set at an angle corresponding with that of the reamer. In Fig. 2 the tool is set at an angle corresponding with the bevel cutter it is working upon. Fig. 3 illustrates drilling a hole at an angle in round stock. The piece to be drilled is clamped to the face plate of the lathe and the drill adjusted to the desired angle. A more or less difficult job is by this means easily and accurately done.

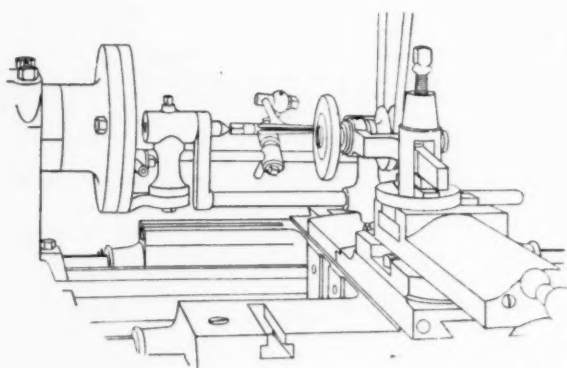


Fig. 1.—Grinding a Taper Reamer.

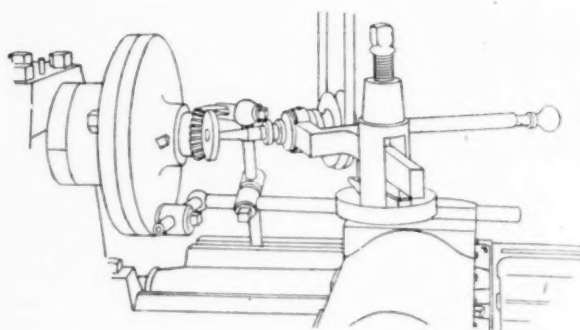


Fig. 2.—Grinding a Bevel Cutter Placed on Expansion Arbor.

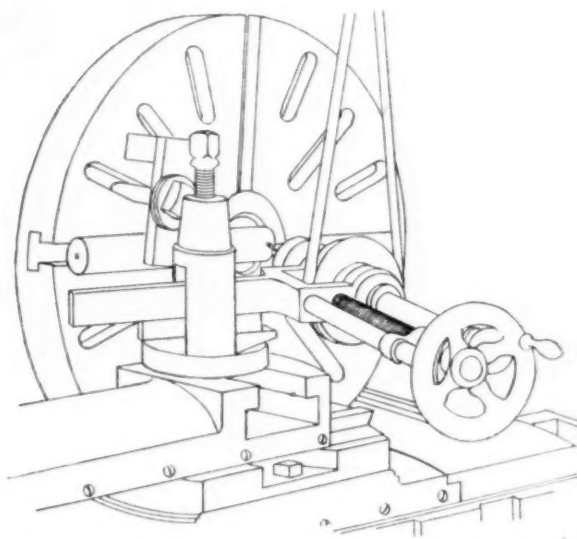


Fig. 3.—Drilling a Hole at an Angle in Round Stock.

THE FARMER COMBINATION LATHE AND GRINDING TOOL.

head by means of which the longitudinal movement of the shaft may be controlled. Secured to the yoke is a removable bracket holding a feed screw operated by a handle and engaging the head on the shaft. The yoke of this tool is a drop forging of 40 carbon steel. The boxes are made of gun metal. The sleeve and shaft are made from 50 carbon steel, as also is the feed screw. The brackets are made of cast gun metal. There is a cutter grinding attachment connected with the tool, consisting of three face plates, one face plate screwing onto the spindle of the lathe, one face plate with expansion and solid arbors, for grinding straight, spiral and bevel mills, one face plate with centers attached for grinding straight and taper reamers. A countershaft and drum with two sets of tight and loose pulleys to regulate speed as desired by the operator.

The machine is designed for grinding solid and shell reamers, either straight or taper milling cutters of all shapes, up to the diameter the lathe will swing; also cutter heads ground in the lathe or on a milling machine.

other problems discussed were those of the forms and methods of foundations, the various types and forms of columns and beams used in connection with these structures and their relative merits. The systems of wind bracing were minutely discussed, and particular attention was paid to the methods of rendering such structures fire proof. The speaker presented an abstract of some recent experiments made by the fire underwriters of New York on fire resisting qualities of cast iron and steel columns. Several instructive instances of failure, more especially in cast iron columns, were noted by the speaker. A noteworthy point in connection with the paper was his extended reference to the use of cast iron columns, which the speaker deemed unqualifiedly as unfit to be used in building construction.

The Naval Bureau of Yards and Docks has decided to issue advertisements in the course of this month for the construction of a stone dry dock of the largest proportions, at Portsmouth, N. H.

The Design of Roughing Rolls.

BY WILLIAM HIRST, TRENTON, N. J.

An object in roll turning that is becoming more and more important is economy in the utilization of the surface of the body of the roll. To this end passes are designed so that there will be no idle grooves or portions of the roll's surface that do not perform useful work in shaping a section or reducing the sectional area of the bloom or billet. The necessity for such economy is brought about by the tendency to make larger sections than was formerly considered practicable in trains of moderate size. When it is considered that the weight of a set of rolls increases as the square of their pitch or diameter, it will be readily appreciated that it is cheaper to roll sections in the smallest train having the requisite strength. For example: The weight of a 12 inch roll would only be about one-half that of a 16-inch of equal length. The actual proportion of the squares of these diameters is not quite 2 to 1, but the difference would be more than made up in that the grooves being the same depth in the larger roll would therefore be proportionally shallower; in other words, the percentage of metal cut away for the grooves is less with the larger roll than with the smaller. The smaller train also takes less power than the larger, and is, consequently, easier on the coal pile.

For the sake of the direct economy resulting therefrom, and sometimes because the larger train is lacking, sections are being rolled in 12-inch and 16 inch merchant trains that were formerly considered impossible. Improvements in the mixtures of iron for casting rolls and the increasing use of steel for the same purpose have helped much in this direction.

In rolling structural sections, such as beams and channels, the capacity and the range of sizes of a finishing train is increased by having the blooms rough shaped or partly formed in the blooming train, where one set of rolls will furnish a roughly formed section for several different sizes by the use of passes that reduce what would be in the finished section the height, which is possible only in the blooming stage of the process. The production of other sections is also greatly facilitated by the use of specially designed roughing rolls which reduce the bloom to the most convenient form or size to suit the different dimensions and weights of finished bars. As in the case of beams and channels, one set of roughing rolls can be adapted to a variety of sizes of one form of section, and in some instances, notably in the case of angles, the rolls can be designed to deliver a billet of a section conforming to the outline of the finished bar. This means fewer passes in the finishing rolls by relieving them of all work except that required to bring the bar to the proper shape and size. There are instances also where the roughing passes for the largest size of a section may be used for the smaller, the T for example: By using one or perhaps two passes to reduce the size, the smaller can be readily made from the roughing rolls for the larger, thus saving the length of roll for the preliminary passes that would otherwise be necessary.

The largest portion of the product of a train is made from the standard sizes of billets or piles, which have to be reduced more or less to bring them to a convenient size for the finishing rolls. They must also have a certain amount of working to create or restore the fibrous structure which has been impaired or destroyed altogether by the high heat necessary for rolling. It is the purpose of this article to show the forms and arrangements of passes best calculated to perform this work. That roughing rolls have a function other than the mere reduction of sectional area is shown by the fact that the amount of reduction in sectional area is frequently specified for the higher grades of iron or steel to insure in the iron a perfect weld, and generally for the purpose just mentioned. Of the three forms of billet, the piled scrap, the laminated pile of muck bar and the steel billet, the first needs the most, and the others less in the order named, because working the pile or billet, particularly the former, at a proper heat is the only means of securing a compact and thoroughly welded bar. It should be understood that all forms of passes are not well adapted to this end. Every train of rolls has its quota of general roughing rolls, and it is by the design of these rolls, neglected as they usually are, that the efficiency and the output of the train may be materially affected simply by not having them turned with a specific object in view. As in everything else, rolls that are turned to be good for everything in general invariably turn out to be not good for anything in particular.

Excepting the rod trains there are three general forms of roughing passes used in merchant trains—namely, the gothic, the diamond and the box pass. Of the first two kinds all the passes in a series are of the same shape, differing only in size. They are not adapted for the most rapid reduction of sectional area, but are designed, as a rule, to give a variety of sizes for round and square bars for which such forms of passes are most used, and for the

smaller sizes of flat bars which do not warrant the use of special roughing rolls. The box pass reduces the billet by working on two of its opposite sides; the diamond and gothic passes by working on opposite corners. The box pass effects the reduction by applying the pressure on the sides of the bar uniformly through the section; the diamond and gothic effect it by alternately changing the angles of the bar from acute to obtuse, with the greatest draft on the corners formed by the acute angles. All these passes—diamonds and gothics—are worked open—that is to say, without fore plates or guides to prevent the bar from turning down in the pass, and for this reason there should not be too great a difference between the two angles of the pass, because the greater the difference the more liable is the bar to turn down. Practice has proven that a pass whose angles are 100 degrees and 80 degrees gives the best results generally. The amount of draft possible is determined by the angles, and as the purpose for which the passes are to be used suggests these it is accordingly limited. As an entering bar cannot be wider than the pass, the height or vertical axis of the preceding one is made somewhat less than the width of the one following. If we were to make the horizontal axis of a succeeding pass the same as the vertical axis of a preceding one, the maximum amount of draft would be represented by the difference between the areas of the passes so constructed, which is about 46.6 per cent. of the smallest. It is not practicable, however, to proportion them so as to work them to their fullest capacity on account of forcing the metal out of the pass and thereby causing a fin, which perhaps might result in cracking the corners of the bar. A fair amount is about 126.5 to 100, which amounts to a reduction of $1\frac{1}{2}$ inches to 1 inch in size, which is sufficient to fill the pass and to steady the bar. The relative dimensions of the diamond pass, which are also coefficient in the construction of the other passes in the series, are as follows:

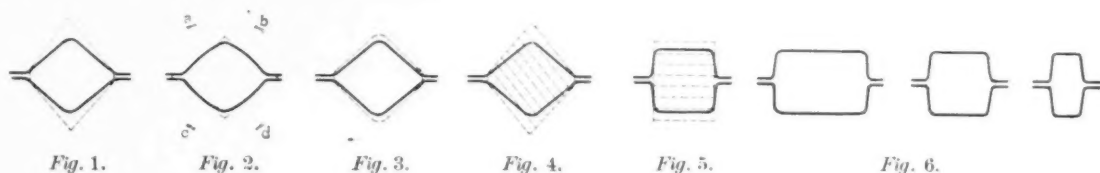
Angles	100 degrees and 80 degrees.
Size of pass	1
Side of pass	1.0154
Horizontal axis (width)	1.532
Vertical axis (height)	1.285
Area	1.048
Reduction (area)	126.5 to 100
Reduction (size), inches	$1\frac{1}{2}$ to 1

Of course it is not absolutely essential that this exact proportion of decrease in size should be adhered to. It may be, and should be, modified to suit any special requirement. The modification, however, should be intelligently made, as one pass overfilling will spoil the working of the whole series; or another not having draft enough to steady the bar may work badly. As before stated, and shown by Fig. 1, the draft in diamond and gothic passes is effected by changing the angles of the sides of the bar, and as the difference between these angles is greater or less so may be the draft; therefore, as the first pass in the series takes a square billet whose sides are angles of 90 degrees, the draft in that pass can only be one half the amount of a pass following another of like shape. In laying out these passes two objects should be kept in view: 1. To have the sizes that will be the most useful; 2. that the draft be not more than 130 to 100, or less than 120 to 100. Making the draft more than the larger amount is to court the danger of forcing the metal out of the pass between the collars of the rolls; making it less than the smaller amount makes the bar sensitive and easily turned down. In the latter case there are too many passes, which causes time to be lost in working with a consequent loss of heat, and if, to save time, the roller omits or skips a pass here and there he overfills them, with the result as stated, making a fin which may lap over in the next pass and mark the bar. As the relative dimensions of the pass given are of a unit of size they can be taken as coefficients; therefore, it is only necessary to determine the sizes of the passes required and to multiply them by coefficients of the side, width and height to get the corresponding dimensions of each pass in the series; but the square of the size must be taken and multiplied by the coefficient of the area when the area is required. The difference between side and size is that the side is measured from one corner to another, while the size is taken from one side to the opposite one, which corresponds to the size of the billet when squared or passed through the same pass two or more times, and by which the pass is referred to. If there are no special sizes required they may simply represent a geometrical series whose ratio is 1.125, or any ratio between 1.09 and 1.14, which are safe limits, and which represent reductions in area of 120 to 100 and 130 to 100, respectively. If special sizes are desirable it is best to take the mean, and to give and take within the limit.

The gothic pass follows the same rule in regard to draft, and in shape it is only a diamond with concave sides. The first pass of a series of gothics can be no smaller than the entering square when a square billet is used, but the size of a round bloom or ball, as it is usually called, may be to the pass as 1.2 is to 1. In the construction of the gothic pass the diamond is laid out first, then the centers *a*, *b*, *c* and *d* are located from the corners a distance equal to the horizontal axis of the diamond; with

these centers, the segments of the circles forming the sides of the pass are described as shown (Fig. 2). This form of pass has been used mostly for muck bar rolls, probably on account of its being nearest the shape of the ball as it comes from the squeezer, or because its corners are blunt, which tends to lessen the number and frequency of cracks and fissures on the corners of the bar. Some of its advocates claim that it rolls more to the center of the bar than the diamond—that its sides have a motion to that effect. If such a motion is a fact, that it is beneficial goes without argument, but apparently it is not so. The sides of the pass have no oblique motion, and like in other form of passes the sides of the pass merely resist the lateral expansion of the bar when it comes in contact with them. It is true that the sides of the pass curve in, so to speak, which would seem to offer more effectual resistance to spread to keep the metal in the pass; but, as in all open passes, the sides of the pass are not close together except in one place—that is, in the plane of the axis of the rolls. From there the space between the rolls widens considerably, and as the reduction really takes place before the smallest part of the pass is reached the incurving sides do not afford the resistance to spread that the outline of the pass seems to indicate. Of course, in all forms of passes the pressure of one roll must be opposed by that of its mate, and in this way the pressure on the bar is equalized on opposite sides and the metal is pressed toward a common center; but, as shown by Figs. 1 and 2, the draft is directly on two opposite corners of the bar in the middle of the pass, while the corners near the openings do not come in contact with the rolls at all until forced out, therefore, like everything under pressure, the displaced metal takes the path of least resistance (if we may borrow that term from our brethren electrical) which is toward the sides of the pass. When it comes in contact with the sides of the pass, and if the pressure, caused by excessive

doing probably more harm than good. In the next pass, as in Fig. 4, while the draft may be heavier, the plates are again subjected to this diagonal pressure as before, and with like result, tending to slide them back again. But as the rolls begin to squeeze the pile, thereby increasing the adhesiveness between the plates, this motion ceases. The seesaw change of shape, however, continues from pass to pass, which cannot fail to have a deteriorating effect upon the bar, unless the same has been thoroughly welded before entering the diamond or gothic passes. In this respect diamond and gothic passes are alike, and wherever used in finishing trains they are almost invariably preceded by two or more box passes. But while this shows the diamond and gothic to be more or less harmful to the pile intended for a finished product their faults become virtues in the muck bar train. The puddle ball as it comes from squeezer, being round in section instead of square, can be subjected to a comparatively heavy draft in the first pass, and as no one is at all particular as to the appearance of muck bar there need not be any nice discrimination as to the amount, which may be 135 to 100 or even 140 to 100, if the mill will stand it. While the continual changing of the angles of the sides of the bar means nothing at all as far as the angles are concerned, its effect on the physical structure of the mass is, in a degree, hurtful in a pile intended to be finished at that heat. Yet this effect of the diamond and gothic pass, defective on the one hand, is just the right thing to work out the cinder in the puddled ball. The action of these passes is not unlike kneading, which, while beneficial in the case of the puddle ball, by eliminating the cinder, is injurious to the fibrous qualities so desirable in the finished product. These qualities cannot be attained to their fullest extent unless the whole section is reduced coincidentally, which requires that the pressure on the pile should be so that it will be uniform throughout the mass, which, as has been shown, is not the



DESIGNS OF ROUGHING ROLLS.

draft, is not too great, spread will be stopped, after which reduction in sectional area goes to increase the length of the bar.

Primarily, the object in rolling is to reduce the cross section of the bar to a proper size and shape; a secondary object, in some cases of equal importance with the first, is the development of a fibrous structure to increase the tensile strength, to raise the elastic limit to the highest attainable degree, and to make it susceptible of considerable elongation without fracture. These qualities are increased in the line of greatest extension (longitudinally), but at a loss in the crosswise strength, and it is in this particular that the skill in the heating, rolling and the design of the rolls is manifested. That good stock can be spoiled in the working is too well known to be more than hinted at, and that the form of the pass in the rolls may have something to do with it is what concerns us in this article. Any form of pass will produce a fibrous structure with the proper heat and an adequate reduction in sectional area, but all forms of passes are not adapted to thoroughly weld a pile so as to secure the greatest lateral or crosswise strength to withstand punching and like operations tending to split the bar. The pile usually brought to the rolls is the ordinary laminated pile of muck bar or a box made of muck bar filled with scrap, in some cases all scrap; but in all, particularly the latter, there are many interstices, which to be closed up require that in passing through the rolls the first three or four passes it should be subjected to the heaviest possible draft that the rolls or the pile will stand. The draft should be distributed evenly over the section, so that the tendency will not be to displace the particles, but to press them together. As previously stated, the amount of draft possible in a diamond or gothic depends upon the difference between the angles of the pass. A square section entering such passes can only be subjected to about one-half the amount that it could be were its shape like that of the pass, therefore a heavy draft for the purpose of welding is impossible in the first pass. By referring to Fig. 3, which shows the position of a pile in a diamond, it will be seen that as the rolls engage only its upper and lower corners the pass does but little else than change its outline. While the corners *a* and *c* are subjected to the pressure of the rolls the corners *b* and *d* are not engaged at all, and the result is that the plates of the pile are merely displaced, the plates on one side are pressed from *a* toward *b*, and from *c* toward *d* on the other, one plate sliding on the next one. Instead of pressing them together it has tended to separate them,

case with the diamond or gothic pass. As shown in Figs. 3 and 4, the rolls having this form of pass work only two diametrically opposite corners, while the other two receive little or no work at all.

In rolling iron the welding must be done in the first passes while the mass is at a welding heat. If it is imperfectly done at that time it will remain so. The creation of a fibrous structure continues throughout the entire operation, and the lower the heat the finer and closer the grain becomes. Fiber is made by reducing the section of the bar so as to make it draw or extend in one direction only; lateral extension tends to open it, which impairs its closeness and fineness and decreases its tenacity. Therefore any form of pass that will draw with the least degree of lateral extension should produce the most perfect and tenacious fiber. Any radical change of section, or inequality of draft, always increases the crosswise motion in the pass, which in a rolling mill is called spread. In the case of iron particularly it is easily seen that the effect of this spread, as we will hereafter call it, is to separate the imperfectly welding particles of the pile and to cause the bar to crack should any tendency to red shortness be present, or the grade of stock be low.

Reducing a round section between plane rolls or two flat dies is a good illustration of unequal draft: The pressure is applied in the middle of the bar, and as the sides are not affected they check or prevent any tendency to draw out, and the result is spread. More than a generation ago manufacturers of shafting and like things found that forgings made between two flat dies were very imperfect, the outside was usually good, but the core invariably turned out to be in an unwelded incoherent state. In short, this was found to be the result of spread between the dies. They remedied the difficulty by using the V-shaped dies, which apply the pressure at four diametrically opposite points toward a common center. A smith, drawing out a small bar, finds it to advantage to reduce it to a square in section and draw it out in that form; but if compelled to draw it out round he uses the V-shaped or half-round swages. These familiar illustrations show that to prevent spread the pressure or draft should be applied to all parts of the section equally, that it may draw out coextensively. In the case of the diamond and gothic passes the draft is all on two opposite corners in the middle of the section, while at the sides it is nothing, and as one part of the bar cannot draw without the other, the section is spread until it meets the resistance of the sides of the pass, when the displaced metal equalizes itself and

the bar begins to draw. For this reason it seems that a fractured billet rolled in these passes is more likely to show a granular structure than a fibrous one.

In contradistinction to the diamond and gothic pass and their effect upon metal is the box pass. This form of pass, while its usefulness and merit have been recognized by many, is not as popular as it deserves to be. The reason of this seems to be that its adaptation to the work for which it is to be used and its construction are not well understood. For welding the pile it cannot be excelled; it takes it readily, and, while keeping its shape, presses the plates together squarely and evenly, as is readily seen by Fig. 5. While being much more economical in regard to rolls, they are fully as efficient in roughing down as far

The billet is passed through the first and second the same side up, then turned quarter way around on its axis and passed through the third and fourth in like manner. The bar cannot be revolved or turned between passes comprising a pair unless the lower one is square, in which case it would fit the upper pass sideways either way it was entered. By using an unequal sided billet, such as 4 x 5 or 5 x 6, or by making the first an idler or dummy (that is, one that does no useful work), all the passes on the bottom can be made square as in Figs. 8 and 9. The passes in Fig. 9 are arranged like those in Fig. 8, but for a train whose first pass is in the top, between the middle and the upper roll, because of entering on the opposite side. When used for the reduction of sectional area only

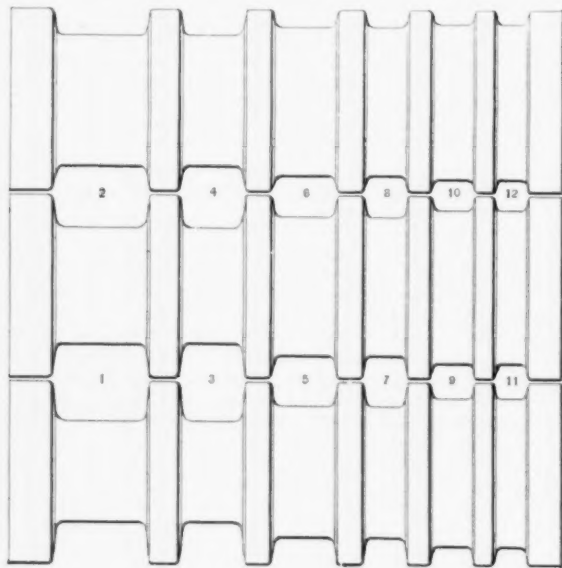


Fig. 7.

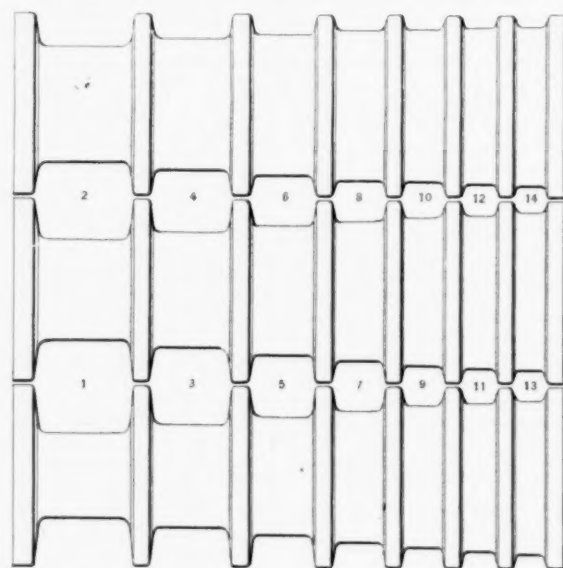


Fig. 8.

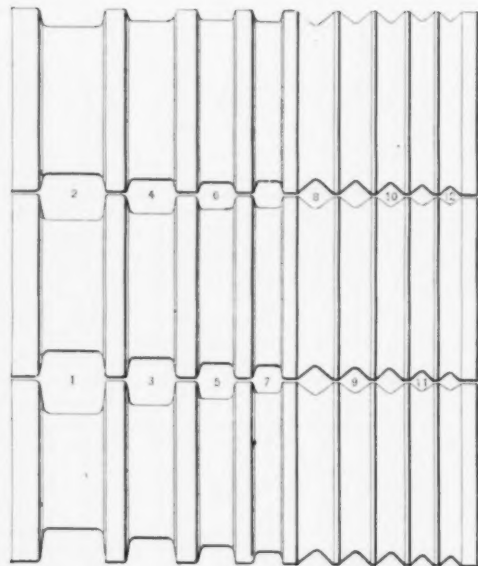


Fig. 9.

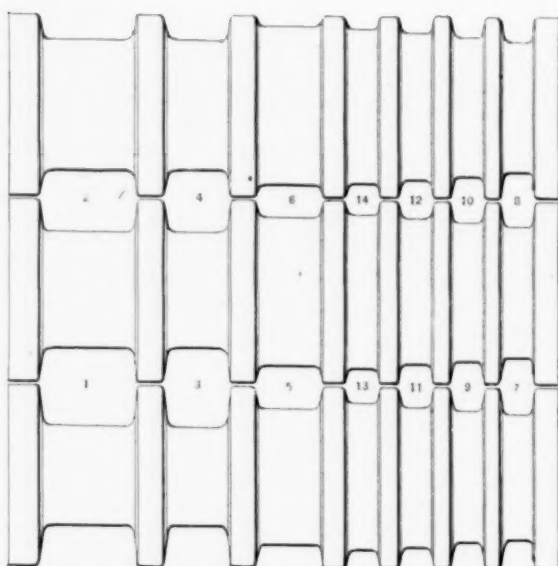


Fig. 10.

DESIGNS OF ROUGHING ROLLS.

as 2 inches square as the diamond, and in the larger passes, taken pass for pass, more so. There are three types of these passes (Fig. 6)—flat, square and edging. Unless for some special reason they are arranged in pairs, one of which is above the other, one-half of each being the same groove in the middle roll. They are also divided into groups of two or more according to the arrangement of the whole series. By a group is meant the number of passes between and including one of each of the square passes in the series; Fig. 7 has four in a group; Figs. 8 and 9 two. On account of the diameters of the rolls in the passes, which will be explained further, the lower one must be the first, and the one directly above it the second; and as the middle roll is used for both passes, bottom and top, the two or pair must have a common width. Therefore, when the first pass in a train is in the bottom (between the middle and lower roll), and the pile or billet is an equal sided square, there are four passes in the group, as in Fig. 7. In a group of this kind the first two are flattening passes, the third an edging and the fourth a square.

The two latter arrangements (8 and 9) are the best, as they allow the billet to be turned between each pass, thereby lessening the liability to fin, which means that they can be given greater draft. Each alternate pass being square, a larger variety of sizes can be had—a convenience which is appreciated in general work. Fig. 10 embodies a series of passes such as would be designed for some special purpose, as for roughing down for flats or any oblong section; they are of the flat and edging types, and their dimensions are arranged to suit the special work they are intended for.

As rolls will not readily take in anything that is large enough to require a bearing on the circumference of the roll of more than 30 degrees, and as heat does not wait upon prolonged efforts that are sometimes necessary to induce the rolls to take the pile, it is best to make the draft so that the pile will enter without any extraordinary assistance, such as a liberal use of sand and the bogie as a battering ram. An extra pass or two will very often save much unnecessary delay, not to speak of the advantage of being able "to strike while the iron's hot." All

points considered, practice shows that the draft should not exceed 133 to 100 in box passes for steel and for iron 125 to 100 in the largest passes. For both, particularly iron, it should be somewhat less in the smaller passes.

Blooming mills are constructed on the principle of taking the upper and middle rolls of the three-high set, and by spreading them apart for the first pass, closing and reversing them for the second, what would in a fixed three-high set be one pass, can be used for two or more, thus making the two rolls answer the purpose of three. These rolls are usually very large and heavy, and by using only two the appurtenances can be made much lighter; and there being no necessity for lifting feed tables and their auxiliaries there is much resultant economy both in cost and operation. Another advantage in this kind of a mill is that, as all grades of steel in ingot cannot be treated alike in the rolls, the draft may be modified to suit, making a greater or less number of passes according as the condition of the ingot may require.

Ordinarily, in finishing trains, 2 inches square is about as small as a box pass can be advantageously used, as at this point, the coherency of the pile being established, the diamond and gothic or the alternate oval and square are more serviceable on account of their being uniform in section.

The difference in size between two passes, one directly above the other, is made by making the diameters of the rolls in the grooves of the middle and top rolls proportionally larger. The collars separating the passes being of one size, a difference between the diameters in the passes makes a corresponding difference in size of the pass. Some roll turners increase the diameter of the top roll only, but as this causes the pass to work badly, it is best to divide the difference between the three. The proportion may be determined in the following manner:

The diameter of the middle roll groove will be the pitch of the rolls less half the sum of the height of the two passes. For the diameters of the top and bottom roll grooves add the difference between the heights of the two passes to the diameter of middle for the top and subtract it therefrom for the bottom. To illustrate this let the size of a lower pass be 4 x 4 inches and the upper 4 x 3 inches, and the pitch of the rolls 12 inches. Then: 12 inches — $\frac{4+3}{2}$ = 8½ inches = diameter of middle roll

groove; and 8½ inches + 4 — 3 = 9½ inches = diameter

of top roll groove; and 8½ inches — 4 — 3 = 1½ inches = diameter of bottom roll groove. If preferred, to find the depths of the grooves in each roll from the pitch line, divide the sum of the heights of the two passes by four for the middle roll groove; subtract the result from the height of the lower pass for the bottom, and from the upper one for the top, as follows: $\frac{4+3}{4}$ inches = 1¾ inches = depth

of middle roll groove; 3 inches — 1¾ inches = 1¼ inches = depth of top roll groove, and 4 inches — 1¾ inches = 2¼ inches = depth of bottom roll groove.

Usually the first pass in a train is between the bottom and the middle rolls, but it sometimes happens that it is necessary to enter between the middle and the top. To make the second pass beneath the first, in such a case, would make the middle groove larger than the top and the bottom larger than the middle. As the difference in the size of a pair of passes is made by variation in the diameters of the grooves, it follows that the second of the pair must be the upper one if we are to conform to the usual practice of setting guides, otherwise double guides, upper and lower for each pass, must be used. The use of double guides wherever avoidable is generally regarded as an unnecessary inconvenience, therefore the common practice is to arrange the run of the passes so that if both passes of the pair are to be used the first will be the lower one. This makes the diameter of the middle groove larger than the bottom and the top larger than the middle, and as the larger diameter will free itself from the bar and at the same time force it down on the guide in the lower roll, a steady straight delivery can be had with the one guide. If the first pass or the largest of the pair were in the top and the second in the bottom, the use of double guides would be unavoidable, because the lower grooves, having the largest diameters, would raise the bar upward, and to avoid the inconvenient arrangement of guides and plates which would be necessary to correct this, it is best in such cases to omit the lower pass of the first pair and to enter the lower one of the next.

A series of passes like those of Figs. 8 and 9 are adapted to work in this way. These two arrangements also have the advantage of having all the lower passes square, which permits the bar to be turned between each pass, whereas in the arrangement of Fig. 8 it can only be turned between each pair. In Fig. 10 the bar cannot be turned while working through the edging passes, except there is a tendency to overfill; then the bar is passed through the flattening pass to reduce it. This causes one of the edging passes to be omitted; but, as the draft is light, this is of no consequence.

A perfect arrangement of the sizes of the passes may, however, be spoiled by an improper distribution, or by the malformation of the passes themselves. Upon the latter, particularly, depends the behavior of the passes in action—whether they will be sensitive as to turning down; whether the bar can be entered with the assurance that it will go straight through. Like all other forms of passes the box pass is more or less sensitive when not filled up, hence the entering bar should be almost the same width as the pass itself, so that it can hold up the bar square, that the pressure of one roll upon it may be directly in line with that of the other. The box pass, with its straight angular sides, works well when properly constructed; but if the corners are rounded by great big fillets the bar becomes sensitive and turns over easily. The fillets in the corners of the grooves should not be larger than enough to round the corners of the bar to prevent their being cooled; a radius of one-eighth of the side of the pass should be enough. For the corners of the collars forming the sides of the pass a radius of ¼ inch for the largest passes and ⅛ inch for the smallest will do.

The idea of large rounded corners is that should the metal be forced out of the pass the collars will not make a fin with a sharp angle at its junction with the body of the metal; but as matter of fact the more the corners are rounded and the greater the space is between the rolls the easier the metal is forced out. As to the proper amount of space between the rolls, or the "opening," as it is commonly called, either by large, round corners on the collars or by spreading the rolls apart, practice varies somewhat. With small passes, say 4 inches or less, it is best to run the rolls about ⅛ inch apart, while larger ones may have considerable more space between them, if for any reason it may seem desirable. Close sides, however, tend to prevent spread, and for this reason they are generally preferred. It requires a tremendous pressure to force metal into a small interstice, but a comparatively small pressure to force it into a large one; therefore, while a heavy draft would force the metal out between rolls which were separated considerably, it would take an unusually heavy one to force it out where the rolls were running close. In the former case overfilling would have no bad effect, because the projection could be rolled in again, which, of course, is not always possible with the narrow fin which might extend beyond the rounded corner of the collar.

The disadvantage of a large opening is that the bar is much more sensitive, especially in the square and edging passes, as, the groove being shallow and the opening large, the slightest swing or bend to one side or the other brings the bar on the collar of the bottom roll or against that of the upper one, which almost invariably turns the bar over. A shallow groove does not have the same control over the bar that the deep one has. The sides of a box groove should be beveled to an angle of about 95 degrees, which is a little more than one-sixteenth in 1 inch. A pass with sides too straight—that is, with not sufficient bevel, is more or less difficult to enter on account of being so near the width of the bar, and a pass with too much bevel, while it may be entered freely, allows too much spread.

As regards the relative values of the diamond and box passes, it will be found that for the largest passes the box pass will demonstrate itself to be the most efficient means for the reduction of sectional area, if properly designed and intelligently arranged in view of the work required of it. Not only should the passes be correctly formed in themselves, but also with reference to each other and to the group in which they are comprised. It has long been a recognized fact that squaring the billet at each alternate pass affords the most favorable condition for rapid reduction coupled with general utility, and for this reason the series of passes in Figs. 8 and 9 are thought to be the best. Like the train itself, the rolls should be designed for a specific purpose and the passes arranged so that each will perform its part in harmony with the others. A pass should not be taken from one and two or three from another to make up a new series, but the whole should be specially adapted to work with reference to the common purpose and for the particular class of work for which the rolls are intended. The particular uses for which the diamond and gothic and the box passes are best adapted is quite clear, and while the former will reduce nearly as fast as the latter, yet they are much less economical in roll space, taking up at least 50 per cent. more for the same work; they also require deeper grooves in the body of the roll, which increases the liability to break and in many cases requires larger diameters of rolls.

For general work, including sectional reduction, the diamond and gothic are best below 2 inches square. They are well adapted to that class of work whose sizes and quantities do not warrant special roughing rolls, but for all other purposes, when its construction and adaptation are understood the box pass will be appreciated and its use extended.

A Western paper facetiously states that "A company has been organized in Chicago to compress air to make engines to compress air to operate themselves to make more compressed air and more engines."

Feed Water Regulators on the British Ship "Pactolus."

The "Pactolus" is the first vessel of the British Navy to have each of her water tube boilers fitted with the feed water regulator, here illustrated. In describing this equipment the *Engineer* says that the rapid fluctuation of the water level in most water tube boilers, consequent on the very small area of water surface in their steam chambers, and their much greater evaporative efficiency, compared with ordinary boilers, have necessitated the use of special apparatus for regulating the water level and insuring its continued and perfect action.

Among the devices that have been adopted for regulating the admission of feed water to boilers, in which the level of the water within the generator is caused to actuate a feed admission valve by means of a float, that applied to the boilers of the "Pactolus" has been found to be very effective and to answer the intention of its design very successfully. The boilers of the "Pactolus" are of the Blechynden water tube type and are eight in number, each of them being fitted with the feed regulator illustrated in Figs. 1 to 5, which is the invention of the patentee of the boilers to which they are applied.

In this particular regulator—there are several arrangements of the apparatus—a double beat spindle valve is employed, its spindle being connected to a pivoted float lever, counterpoised by an adjustable weight, as shown in Fig. 5, the valve chest, shown in section in Figs. 1 and 2, in which this valve and its seat-

in direct communication with that of the boiler, the two valves are always under boiler pressure, the piston formed on the end of the valve spindle merely acting as a guide to it. The position of the internal sliding sleeve and that of the valve seats are indicated externally on the index plate attached to the guide bracket shown. By moving the valve seatings to their extreme position the feed water can enter the boiler irrespective of the position of the float or the water level. This is a special advantage when an extra supply of feed water is required—e. g., to prevent the safety valves lifting by a sudden stoppage of the main engine.

The arrangement of the regulator and the feed supply pipes adopted in the "Pactolus," as shown in Figs. 4 and 5, where the feed is led through the regulator to the lower chambers of the boiler, is the result of a series of experimental trials which proved the advan-

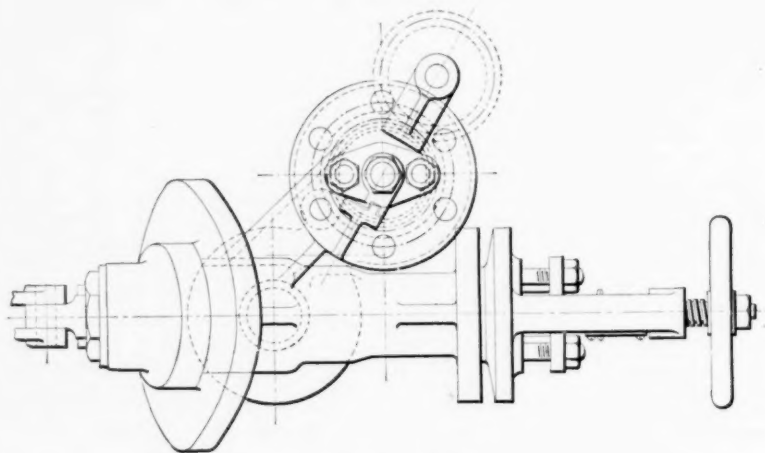


Fig. 3. - Plan Fig. 2.

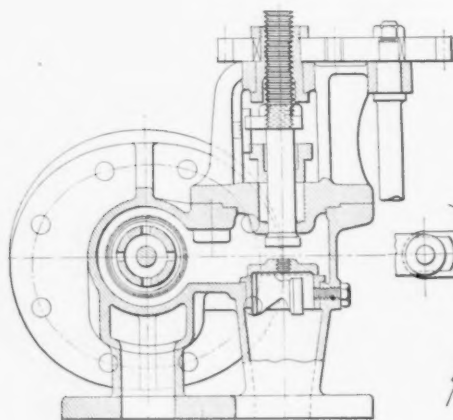


Fig. 1.

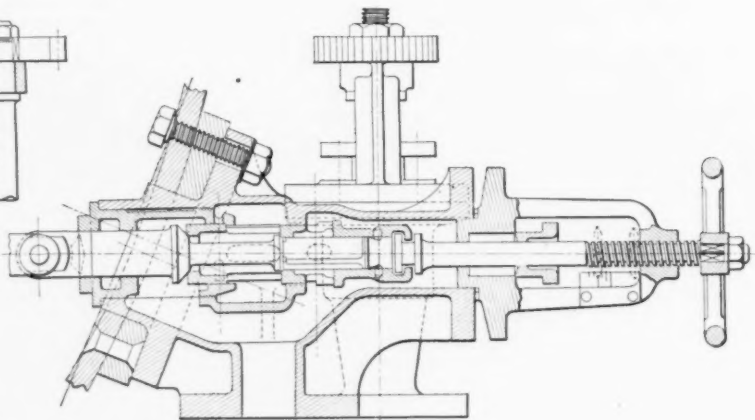


Fig. 2.

Sections of Valve Chest.

FEED WATER REGULATORS ON THE BRITISH SHIP "PACTOLUS."

ings are contained, having inlet and outlet apertures. Within the valve chest is an inner cylindrical casing or sleeve, movable in the direction of its axis, on one end of and within which the spindle valves are seated, this sleeve being provided with ports communicating with the interior of the valve box, as shown, the feed water passage being through these ports and the double beat valve seats, when open, to the outlet to the boiler. The cylindrical sleeve, being movable longitudinally within the valve chest, is made to approach or recede from the spindle valves by means of the screwed end of the rod shown passing through the stuffing box at the outer end of the valve chest, working in the boss of the bridge bracket by an ordinary hand wheel.

It will thus be seen that as the movable sleeve containing the valve seatings is capable of moving nearer to or receding from the two valves, the position of the float lever—by its being attached to the valve spindle—at which it closes the valves is changed, and consequently the levels of the water in the generator at which feed water is permitted to enter, or is cut off from it, are determined. The interior of the valve chest being

tages of introducing the feed water in this manner instead of directly into the upper or steam chamber.

B. D. Woodward, assistant commissioner general United States Commission to the Paris Exposition, says that the total amount of power estimated as necessary for the Paris Exposition is 20,000 horse-power, of which about 15,000 will probably be allotted for illuminating purposes and 5000 for motive power. Upon this assumption there is allowed a consumption of 440,000 pounds of steam per hour. This will require 200 tons of coal a day, and the water required for condensing purposes is estimated at more than 260,000,000 cubic feet for the whole period of the exposition.

All the interests of Alois von Bauer in the firm of Von Bauer & Co. having been acquired by W. H. Smith and Louis Schwarz, the business of the firm, as iron contractors and engineers, will hereafter be conducted under the name Smith & Schwarz, with office in the Townsend Building, corner Broadway and Twenty-fifth street, New York.

Chicago Belt Line Industrial Locations.

The Chicago Belt Railway Company are inviting the attention of those who are seeking a desirable location for new manufacturing plants to the advantages which are offered along their line. The company, together with the Chicago & Western Indiana Railroad Company, who are under the same management, control a system of tracks which practically constitute two belt roads, one of which encircles the city of Chicago, considerably inside the corporation limits, while the other passes through an outlying circle of industrial suburbs, including Cragin, West Chicago, Hawthorn, Hayford, Auburn Park, Oakdale, Burnside, Pullman, Stony Island, South Chicago, Englewood, Kensington, &c. The system is so complete that junctions are effected at eligible points with the 25 trunk line railroads which radiate in every direction from Chicago, so that a location on the Belt Railway tracks is equivalent to a location on all of these different railroads and on each of them. The company claim to offer unequaled transportation facilities and an extremely low tariff for the services which they render. These services are already in use by some of the largest manufacturing concerns in the United States, and of course the greater

Company as trustees, to secure 5 per cent. 50-year gold bonds, bearing interest from March 1, 1899. It covers "nine iron blast furnaces, a horseshoe and rolling mill, coking, coal and steam coal on boundaries of over 50,000 acres of land, the limonite and brown hematite or mountain and other iron ores on boundaries of over 65,000 acres of land;" also fixtures, leases, &c. The first issue of \$7,500,000 bonds has all been subscribed; of this \$2,000,000 was to be used only to retire bonds of the Carter Coal & Iron Company. The residue of the loan (\$5,500,000) can be used only for "working capital," or "for the acquisition of other property."

A General Advance in Stoves.

Manufacturers Meet in Chicago and Agree to Higher Prices.

A meeting of prominent stove manufacturers from all parts of the country was held at the Auditorium Hotel, Chicago, on the 9th inst. As a result of their deliberations it was informally agreed that it is absolutely necessary to advance selling prices of stoves immediately not less than

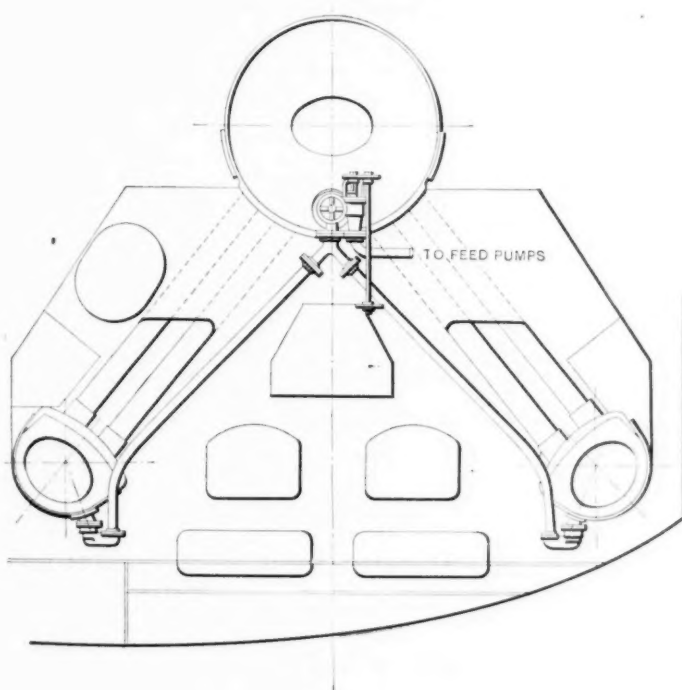


Fig. 4.

Arrangement of the Regulator and Feed Supply Pipes.

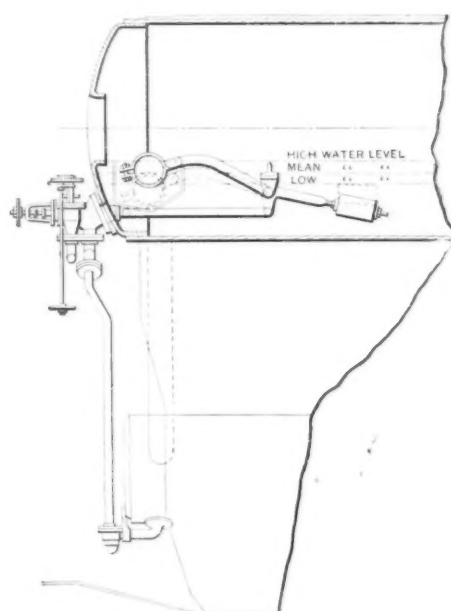


Fig. 5.

FEED WATER REGULATORS ON THE BRITISH SHIP "PACTOLUS"

the use which is thus made the more will the general advantages be reaped by other parties who secure similar locations. Eligible factory sites adjacent to the company's system are to be had at very reasonable figures and upon favorable terms. The company are particularly anxious to have an investigation of their facilities and advantages made by old established manufacturers of Eastern States who are looking for a location for Western branches or for the removal of their plants to the West. Correspondence should be addressed to B. Thomas, president and general manager, Room 13, Dearborn Station, Chicago.

The Virginia Iron, Coal and Coke Company.—The Virginia & South Virginia Railway Company, whose stock and bonds are all owned by the Virginia Iron, Coal & Coke Company, have been formally organized and have taken title to the following properties: Bristol, Elizabethton & North Carolina Railroad, Bristol to Elizabethton, Tenn., 22 miles; South Atlantic & Ohio Railway, Bristol, Tenn., to Big Stone Gap, Va., 70 miles. The Virginia & Southwestern have an authorized capital of \$3,000,000, and, it is said, will issue to the Virginia Iron, Coal & Coke Company \$1,000,000 of first mortgage 5 per cent. gold bonds, due March 1, 1949. Their directors are the same as those of the Coal & Coke Company—viz., E. R. Chapman, M. D. Chapman and C. H. Eicks of New York, B. L. Dulaney of Bristol, Tenn., and George L. Carter of Pulaski, Va. The new mortgage of the Virginia Company is for \$10,000,000, and is made to the Manhattan Trust

10 per cent., which advance will barely cover the increased cost of the product due to the advances which have already occurred in the cost of materials. A large number of manufacturers were in attendance and the decision was forced upon them by the recent sharp advance in the prices of not only iron and steel but of all other materials entering into the production of stoves. Not only have such prices advanced materially, but the upward movement does not seem to have culminated. Much higher prices are confidently expected, particularly on iron and steel, as the demand is running considerably in excess of the present supply.

The fourth annual convention of the National Association of Bridge and Structural Iron Workers in session in Pittsburgh last week closed with the election of the following officers: John T. Butler, Buffalo, N. Y., president; J. W. Pryale, Pittsburgh, secretary treasurer; W. E. Barry, New York, vice-president; W. J. Ryan, Boston, general organizer. It is probable the headquarters of this organization will be in Pittsburgh in the future.

The officers of the National Metal Polishers, Platers and Brass Workers' Union, with headquarters in Cleveland, Ohio, claim that 50 organizers have been sent to the largest cities throughout the country to strengthen their organization for a demand for a wage advance of from 15 to 20 per cent.

The National Founders' Association.

The proceedings of the second annual meeting of the National Founders' Association, held at Buffalo, February 1, have just been made public. Reference has already been made in these columns to the purposes of this association, which are similar to those of the Stove Founders' National Defense Association, in promoting more harmonious relations between employers and their employees.

The meeting was attended by representatives of a considerable number of the most important foundries in the United States making machinery castings. The business transacted during the meeting comprised the consideration of the address of the president and the reports of the secretary and treasurer, the reconstruction of the constitution and action on a request for a conference from Martin Fox, president of the Iron Molders' Union of North America. The address of President Gates referred principally to the routine business of the association, but also discussed to some extent the purposes of the organization and the manner in which they would be carried out. Referring to what had been done during the year in settling some labor troubles, the following statement was made:

"The two cases settled by your Fourth District Committee have leavened the minds of the employees with the belief that this association is not intended to oppress labor, but to recognize its just claims, and as to these are added other just decrees, the entire labor element with which this association comes in contact will willingly accept its advice in solving its difficulties, and the resort to strikes be largely, if not wholly, eliminated. If, however, it becomes necessary to resort to extreme measures, your District Committee and your officers should have your loyal support. Insisting at all times that the action of your officers shall be in strict equity and justice, encourage and advise them by letter and otherwise, and, through proper channels at proper times and places, let it be known that you have every confidence in the association and its officers and will stand by it until it wins. Any other action will at once mark a weak spot in our defense and may return to you as a boomerang."

It will be seen from the above that the association, while not organized to fight labor, will nevertheless be prepared if occasion arises to vigorously support the side of employers. That they further do not intend to antagonize trades unions is shown by the following extract from the president's report:

"In any event it should be the policy to persuade the men to remain at work until such time as your District Committee have made their final decision and the same has been accepted or rejected. If rejected, we think it should be the policy of our members, other things being equal, to retain the services of such men as take the place of strikers even to insisting that they be allowed to join the union, if they so desire, in case union help is re-employed. When men are wanted to take the place of strikers much assistance can be rendered if each member will take it upon himself to offer the secretary the services of any volunteers whom they may secure in their own establishments, or of those applying for work who are willing to go to such position."

The report of the secretary reviewed the work done by him during the year and was particularly interesting in the references made to the successful growth in membership. Some phases of the labor question were discussed which appear to make an organization of this kind extremely desirable and to call for co-operation with the association of those founders who have not yet seen their way clear to enroll themselves among the members. The statement of the treasurer showed the association to be in good financial condition.

The letter of President Fox of the Iron Molders' Union was the result of unofficial conferences which had been held between him and President Gates. A mutual desire existed to bring the two organizations together, and it had been decided previous to the meeting that the best way in which to effect this was by a letter addressed to the association upon which official action could then be taken. The following committee was appointed to take this matter in charge and meet a committee from the Iron Molders' Union: G. E. Emmons, General Electric Company, Schenectady, N. Y.; A. J. Caldwell, Henry R. Worthington, Brooklyn, N. Y.; L. E. Bellows, Deane Steam Pump Company, Holyoke, Mass.; Edward Maher, Maher & Flockhart, Newark, N. J.; Frank Patterson, Patterson Foundry Company, Cleveland, Ohio; O. P. Letchworth, Pratt & Letchworth Company, Buffalo, N. Y., and the president, P. W. Gates, Gates Iron Works, Chicago.

The election of officers, Mr. Gates having declined to serve another year, resulted in the selection of Chas. A. Bauer of Warder, Bushnell & Glessner, Springfield, Ohio, for president, H. M. Leland, Leland & Falconer Mfg. Company, Detroit, Mich., for vice-president, W. H. Wells, Holly Mfg. Company, Lockport, N. Y., re-elected treasurer, and John A. Penton, editor of *The Foundry*,

Detroit, Mich., re-elected secretary. Mr. Bauer subsequently declined the presidency on account of illness, and the Administrative Council elected O. P. Letchworth of Buffalo to fill that position. District committees were also selected for the different districts of the country.

The committee to confer with the Iron Molders' Union held an organizing meeting February 15 at New York, when an appointment was made with the union to meet subsequently in that city. This meeting has just been held, and agreements have been entered into which are regarded as eminently satisfactory to both sides, and will undoubtedly be approved by both associations. The National Founders' Association has now been placed on a good working basis, and it is expected that from this time forth a condition of affairs will be established in this branch of trade which will minimize if not wholly prevent labor troubles.

The British Production of Pig Iron in 1898.

The total production of pig iron in the United Kingdom in 1898, as ascertained by the British Iron Trade Association, has been 8,631,151 tons, which is a decrease of 185,958 tons on the output of the previous year. The production is made up of the following quantities of different descriptions:

Description.	Quantity. Tons.
Forge and foundry.....	4,408,017
Hematite.....	3,273,232
Basic.....	730,028
Spiegel.....	219,874
Total.....	8,631,151

Forge and foundry iron was produced in every district, hematite in six districts, basic in nine districts and spiegel in five districts. The largest make of forge and foundry was in Cleveland, the largest make of hematite in the same district, the largest make of basic in Cleveland and the largest make of spiegeleisen in Lancashire. The returns from the basic iron makers are the most complete that have hitherto been published. The details of output in the different districts in 1898, compared with 1897, are as under:

Make of Pig Iron in Different Districts.

	1897. Tons.	1898. Tons.	Increase (+) or decrease (-) in 1898 Tons.
Scotland.....	1,187,637	1,190,264	+ 2,627
Durham.....	3,197,641	1,086,258	- 69,543
Cleveland.....		2,041,840	+ 16,326
West Cumberland.....	819,475	835,801	+ 30,858
Lancashire.....	706,893	737,751	+ 297,502
South Wales.....	804,816	507,314	+ 12,354
Lincolnshire.....	306,640	318,994	+ 30,600
Northamptonshire.....	250,000	280,600	+ 17,743
Derbyshire.....	303,334	321,077	+ 44,676
Leicestershire, &c.....	228,637	273,313	+ 2,040
North Staffordshire.....	239,297	241,337	+ 15,487
South Staffordshire.....	360,200	375,687	+ 1,688
South and West Yorkshire.....	299,177	297,489	+ 3,531
Shropshire.....	38,571	42,102	+ 5,520
North Wales.....	53,291	58,911	+ 833
Gloucester, Wiltshire, &c..	21,500	22,333	
Totals.....	8,817,109	8,631,151	- 185,958

There are now seven works engaged in the production of spiegeleisen in this country, four of them being in Lancashire, one in Cleveland, one in West Cumberland and one in Wales.

The quantities of different descriptions of pig produced in each district are shown in the next table:

Make of Different Descriptions of Pig Iron in Great Britain in 1898.

District.	Forge and Foundry. Tons.	Hematite. Tons.	Basic. Tons.	Spiegel, &c. Tons.
Scotland.....	650,000	490,264		50,000
Northeast coast (Cleveland & Durham).....	1,132,813	600,283	271,258	37,486
West Cumberland.....	468,659	503,179	54,429	
Lancashire.....	194,941	591,600		49,950
South Wales.....	72,180	503,553	28,506	73,512
Lincolnshire.....	17,468	464,953		24,893
Northamptonshire.....	264,904		54,090	
Derbyshire.....	280,600			
Leicestershire.....	321,077			
North Staffordshire.....	273,313			
South Staffordshire.....	241,337			
South and West Yorkshire.....	265,600		110,087	
Shropshire.....	175,203		122,286	
North Wales.....	2,312		22,406	34,033
Shropshire.....	25,286		16,816	
Other districts.....	22,333			
Total.....	4,408,017	3,273,232	730,028	219,874

The average number of furnaces in blast was 297 7-12 out of a total of 490 furnaces. There are 14 furnaces building in Great Britain.

According to a statement in the *Italia*, the well known French ironmasters, Schneider & Co. of Creusot, are about to establish blast furnaces at Piombino, in Italy, in order to work the iron ore from the island of Elba.

The Largest Water Motor Air Compressor.

Henry R. Worthington of Brooklyn have recently installed with the Cataract Construction Company of Niagara Falls, N. Y., a 24 x 14 x 15 water motor air compressor, the largest machine of this kind which has ever been constructed. It is used to furnish air, at about 125 pounds pressure, to operate the switches in their main section. It is located at the bottom of the pit, where it is difficult of access, where little attention can be given it, and is so designed that it will stop when an air pressure of 150 pounds is reached, and start again if the pressure falls. The motor runs at from 45 to 50 feet piston speed, giving a capacity of about 100 cubic feet of free air per minute.

The over all dimensions are given in the accompanying end and side elevations. The water inlet and outlet are each 12 inches in diameter, and the air delivery 3 inches. The air end is of the Worthington standard form. The motor end is of the brass lined piston type, provided with a water dash which contains some novel features. As the piston completes its stroke it cuts off by its own motion the exhaust passage. On the return stroke the water at first passes through the small check valves shown in the drawing, which supply the water until the piston has opened the ports in the lining, which thereafter furnish the required supply. The ports are of necessity large, and, as will be seen, completely envelop the piston ring. Connections with the lower end of the cylinder from these ports completely drain the motor end and prevent the accumulation of sediment in the piston barrel.

The valves are of the ordinary piston type, both alike, but the ports are so arranged as to obviate the necessity

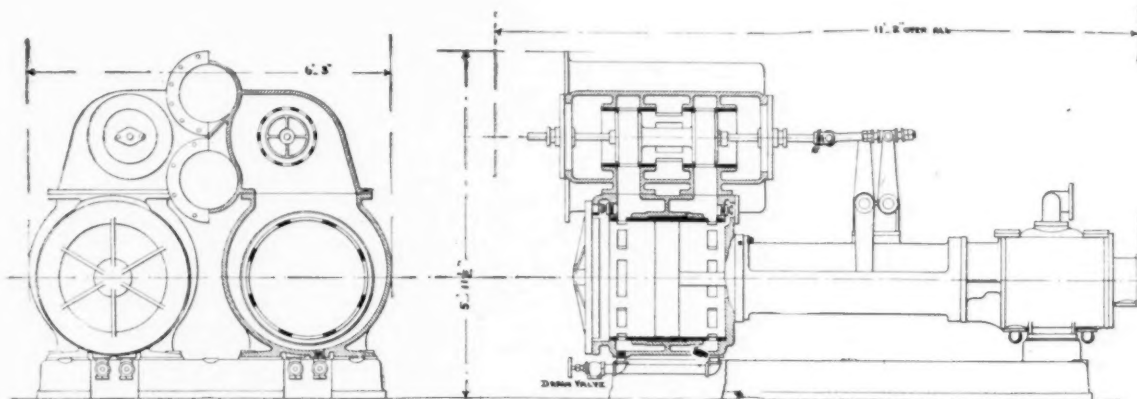
The Mineral Resources of Porto Rico.

WASHINGTON, March 14, 1899.—Robert T. Hill of the United States Geological Survey, who has just returned from a tour of investigation of the island of Porto Rico with a view to determining the extent and character of its mineral resources, has made a preliminary report of much interest. Through the courtesy of the director of the survey the correspondent of *The Iron Age* is enabled to present the following abstract:

The island of Porto Rico consists of three geologic elements: 1. A central system of deeply ribbed and corrugated mountains, with V-shaped gorges and ridges. 2. Lower hills, forming irregular bands along the north and south coast. 3. Playa plains, consisting of alluvial soil, occupying old reclaimed estuaries, which extend from the foot of the central mountain across the line of foothills to the seashore.

It is roughly estimated that nine-tenths of the island is of the mountainous character and that the remaining tenth is of the foothill and playa character. The central mountains are composed of water sorted volcanic ejecta, tuffs and conglomerates, with occasional dikes and masses of interbedded sub-crystalline bluish limestone of rare or exceptional occurrence, all of which is entirely decayed at the surface, breaking down into a red clay resembling that of the Southern Appalachians. The dikes are of hard, black, igneous rock, with small white porphyritic crystals. In the east the substructure is said to be granites and especially syenites. In Naguabo and in Mayaguez some serpentine rocks have been observed.

The foothills are composed exclusively of rocks of sea origin, consisting of the peculiar type of tropical white



Sectional End Elevation.

Sectional Side Elevation.

THE LARGEST WATER MOTOR AIR COMPRESSOR

of crossing the valve motion on the outside, or of reversing the ports in the main casting, the inlet water entering the ports from the outer edges of the piston on one side and from the inner edges of the piston on the other. This construction secures an exceedingly compact valve chamber when one considers the enormous areas required for the passages.

*A Glasgow paper prints the following extract from a letter just received by Mr. Gow, factor, Wishaw Estate, from Lord Belhaven, who is at present in Egypt for the benefit of his health: "I have been thinking very much lately about the great loss of trade in iron and steel bridges which is now going on, and which I hear about constantly in this country. I have conversed with several engineers employed both on the military and the Egyptian Government railways, and they complain that they cannot get any bridges or locomotives from England or Scotland within a reasonable time. Here is a case in point. Before Christmas the Sirdar determined to have a permanent bridge over the Atbara built before the next Nile floods, which come down in July. He asked for tenders in England and Scotland, and they could not supply the bridge for periods (in the different offers) of from 6 to 12 months, being so full of orders. They then telegraphed to America (United States), and got a promise that the whole bridge should be on board in six weeks. The same thing happened about locomotives for the military railway, 3 feet 6 inches gauge. They got some put on board in six weeks, also in the United States. Now, here are the Cape, Uganda, Egypt, India, China and probably many more countries crying out for iron and steel bridges, and all the factories are too full of orders; consequently the work goes to America and Belgium, and this is not a momentary boom, but just the first flood of orders, which will in all probability (I might say for a certainty) last for years."

limestones, of a loose texture, chalky, marly and shelly nature, of various degrees of induration. The rocks of the central mountain region are of cretaceous and possibly early eocene age; at least no evidence has been as yet discovered to establish other dates for their formation. The white limestones of the coastal hills are all of later tertiary and pleistocene age.

The playa deposits are alluvial formations, consisting usually of a rich, chocolate colored, sandy loam.

Metals.

The metallic minerals most frequently found, and which form the object of much search, are gold, carbonate and sulphide of copper and magnetic oxide of iron. Traces of lead and indications of mercury, manganese and bismuth have also been noted.

Gold.—Almost since the date of the discovery of the island gold has been washed in small quantities from many of its rivers, especially those of the north and east end, notably the Loquillo and Loiza. Gold also occurs in the streams near Corrozal, a village on the northern central side of the island. It has never been found in great quantities, 50 cents to \$1 a day representing the average product of a hard day's labor. The gold is obtained by the natives from the river sand and gravel. The mother rock of this metal has never been determined. A great many American prospectors of late have been seeking for quartz veins toward the heads of the streams. It is my opinion, however, that such will not be found, as there are no evidences of their existing upon the island, at least no visible quartz veins could be detected by me anywhere, although there may be small stringer veins. It is more probable that the vein material of the gold in the mother rock is pyrite, as this is quite frequently encountered along the contacts.

While it is impossible to reach any positive conclusion as to the quantity or value of the gold of the island,

experience has shown that the placer deposits are not rich or extensive. The question of its occurrence in the mother rocks is a problem which will require careful and patient exploration by scientific methods. The prospector from the United States will find that the matrix is entirely different from that with which he has been familiar, the general geologic conditions more nearly resembling those of Colombia and Panama than of the North American gold fields.

Copper.—Copper pyrites and the stains of carbonate of copper are frequently encountered in the central mountain region, but nowhere in quantities sufficient to justify expectation of extensive occurrence. One deposit of impure malachite upon which the owners placed great hopes was developed and one small shipment of ore exhausted the deposit.

Iron.—Nine tenths of the rocks of the island are of a basic nature, containing a large proportion of iron. Inasmuch as these are and have long been undergoing oxidation and alternation, theoretically the conditions are favorable for the occurrence of valuable iron deposits, and in one or two instances these undoubtedly exist, notably north of Juncos. At this place there is a large deposit of magnetic iron ore of great purity, containing 66 per cent. of iron and less than 0.023 phosphorus. A French engineer has calculated that there are at least 35,000,000 tons of this ore in sight. At present it is many miles from a seaport and its development will necessitate the construction of a railway. In my opinion this deposit is the most valuable metallic resource of the island at present in sight, and American capital will develop it as soon as allowed to do so legally. It is said that the conditions of this deposit could not be more favorable. The ore is encountered in compact masses, easy of extraction and covered only by a light layer of earth. It constitutes a small hill about 150 m. high, at the opening of a plain which leads to a port by a 2 per cent. grade. The construction of a railway 15 km. long could be done quickly and with little cost. The shipping port, Naguabo, is said to admit ships of 20 feet draft. It has been estimated that this deposit contains 10,000,000 tons of iron, but I am not in a position to verify this estimate.

The following is an analysis made for Patterson & Stead of Middleborough, England:

Analysis of Juncos, Porto Rico, Iron Ore Dried at 212 Degrees.

Peroxide of iron.....	72.500	Sulphur.....	0.008
Protoxide of iron.....	19.671	Phosphoric acid.....	0.056
Protoxide of magnesia (manganese).....	0.232	Arsenic.....	Trace
Alumina.....	Trace	Carbonic acid.....	Trace
Lime.....	0.271	Water.....	1.790
Magnesia.....	0.170	Total.....	99.998
Silica.....	5.300	Total metallic iron.....	65.45

Magnetic sands, like those so abundant in the adjacent island of Martinique, occur in many of the stream beds, notably those in the western part of the island. These are worthy of further investigation. Many ferruginous deposits were noticed by the writer in his reconnaissance, none of which seemed of sufficient importance for development, but all were of such a nature as to indicate that the field of possibilities is worthy of careful study.

Conclusion.

In conclusion I should like to make a few remarks concerning the entirely different occurrence and appearance of the economic resources of Porto Rico from those of our own country, and the North American continent in general. The geologic type of the island is antillean in its aspect, and the sequence, arrangement and composition of the rocks are entirely different from those with which we are familiar in our country. The matrix and country rock of the metallic minerals are not of the quartziferous type familiar to prospectors in the United States, but are made up entirely of basic igneous rocks, such as tuffs and volcanic conglomerates of the kind known in Central America and Colombia as "caleche," while the dyke and vein material is largely of hornblende, andesite porphyry. Furthermore, the bituminous material instead of occurring in rocks of the carboniferous period, as it largely does in our country, is found entirely in strata of the tertiary period. The ordinary prospector will find these conditions so foreign to those of the United States that he will be entirely lost in endeavoring to follow what are to him ordinary indications of mineral wealth.

Owing to this fact it is necessary that the mineral resources of Porto Rico should receive thorough scientific study and exploitation. In my opinion such investigation will result in the discovery and development of many interesting resources which have escaped the observation of practical mining prospectors and my own eye in my brief reconnaissance. It is especially important, in my opinion, that the sands and alluvial deposits of each of the 1200 streams of the island should be carefully studied, for it is both possible and probable that they may contain platinum and other rarer minerals. I am inclined to the latter opinion because of the resemblance of the formation in a general way to those of Colombia, South America, in which these minerals occur. Furthermore, the contact

phenomena are worthy of scientific investigation, and the phosphatic limestones of the coastal formations deserve systematic study.

Pyrite is frequently encountered in the igneous rocks of the central mountains. Many specimens were brought to me, but no great quantity as yet has been discovered.

W. L. C.

The Park Steel Company.

The iron trade will learn with interest that the one concern in it who have more than any other shunned publicity have now come forward with a proposition to place preferred stock upon the market. It is only recently that the incorporation in New Jersey of the old firm of Park, Brother & Co., Limited, of Pittsburgh was announced, the title being the Park Steel Company. The capital is \$5,000,000 of 7 per cent. cumulative preferred stock and \$5,000,000 of common stock. The preferred stock has also priority as to assets in case of dissolution or liquidation. There is no bonded or mortgage debt, nor can, according to the charter, any such debt be created without the consent of the holders of record of at least 75 per cent. of the preferred stock.

Baring, Magown & Co. of New York, in conjunction with Baring Brothers & Co., Limited, of London, are now offering at par \$4,500,000 of the preferred stock. The aggregate assets upon which the issue of \$5,000,000 of preferred stock is based appear to be \$5,204,302.88. This consists, according to the appraisal of James Hemphill of Mackintosh, Hemphill & Co., Incorporated; A. E. W. Painter, president of the People's National Bank, and W. F. Anll, real estate, of \$1,132,602.88, the value of real estate and buildings, and \$2,121,700, machinery and tools. It includes accounts receivable and bills receivable retained by the venders, who in lieu thereof have paid to the new company \$430,378.83 in cash. It includes also merchandise transferred to the new company inventoried at \$1,519,621.17. These four sums make up the total of \$5,204,302.88 underlying the issue of the preferred stock. The company start with no existing liabilities whatever, and accountants and venders consider that the working capital of \$1,950,000, consisting of cash in lieu of bills received and materials in hand as above, will be sufficient to continue the business, the sales, according to a letter from W. G. Park, chairman of Park, Brother & Co., Limited, amounting to about \$5,000,000 annually.

In order that the position of the preferred shares may be rendered quite independent of any possible fluctuations in the price of raw materials it has been stipulated in the charter and in the by-laws of the company that 33 1/3 per cent. of the net earnings, after the payment of the 7 per cent. dividend on the preferred stock, shall be invested as a reserve dividend fund until the amount of said fund is \$350,000.

The profits made for a series of years have been reported by Deloitte, Dever, Griffiths & Co., accountants, of New York, as follows:

Year ending July 31,	
1889.....	\$609,181.14
1890.....	755,879.82
1891.....	631,944.39
1892.....	513,896.80
1893.....	467,368.23
1894.....	133,241.08
1895.....	390,751.40
1896.....	437,655.97
1897.....	154,104.33
1898.....	512,505.22
	\$4,606,528.58
Or an average per annum of.....	\$460,652.85

These figures naturally show some very violent fluctuations. The accountants in their report say: "From the information and evidence placed before us it is our opinion that the decrease in profits during the fiscal years ended 31st July, 1894 and 1897, respectively, arose from the abnormal conditions during those years, which, we believe, generally unfavorably affected the manufacturing business of the United States. In the former year the financial panic caused a large depression in the iron and steel business of the country, and the sales of this company decreased 25 per cent. compared with the sales of the immediately preceding and subsequent years, with a smaller margin of manufacturing profit; and in the latter year (1896-7) the uncertainty of the future monetary policy of the country created a depression in the trade, resulting in decreased sales and diminution of profits."

"All expenditures (averaging \$231,127 per annum) in connection with the maintenance and repairs of the property have been charged against the profits, and we are assured that the works have been kept in good condition and therefore no special reserve for depreciation of property is necessary."

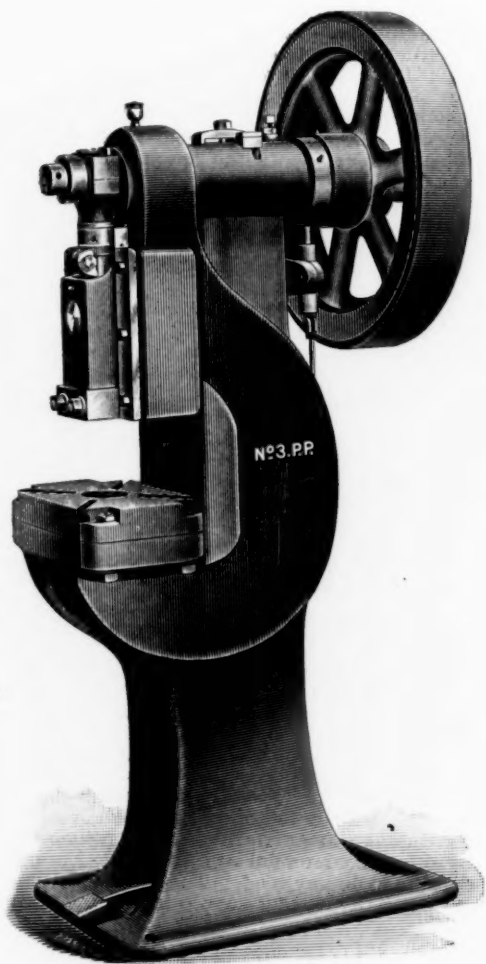
W. G. Park, chairman of Park, Brother & Co., Limited, in a letter to the bankers says: "The strong market for iron and steel, together with important economies

which have just been introduced, will, in my opinion, make the net earnings of the company for the year commencing March 1, 1899, at least \$600,000." What these improvements are is not specified.

The directors for the first year are William G. Park, David E. Park, James H. Park, George D. Hallock and Herbert L. Griggs.

Rudolphi & Krummel Punching Press.

Rudolphi & Krummel, 100 North Clinton street, Chicago, have brought out a new line of punching presses differing considerably in details from such presses as heretofore made. Punching presses of this type are often preferred to inclinable open back and straight sided presses for plain blanking or punching operations, particularly for cutting comparatively small blanks of the heavier gauges of sheet metal. In some cases they can be placed more advantageously in relation to the line shaft and to



RUDOLPHI & KRUMMEL PUNCHING PRESS.

the general arrangement of the shop, owing to the fact that the shaft runs at right angles to the front of the operator. They are particularly useful when the parts to be punched would interfere with the fly wheel, such as the rims of wheels, the flat and angular irons of tank work, parts of architectural iron work, &c. In the general design of these presses the hollow column principle has been adopted in preference to the ribbed frame of T section, being considered stronger because the pressure is transmitted in a straighter line, the parts taking up the pressure being the two sides of the frame. The connection is similar in principle to the one used in the firm's open back and straight sided presses. It has a longer range of adjustment than the eccentric sleeve, and overcomes the danger of slipping in heavy stamping operations. An outer sleeve of large diameter clamps on an inner steel shank, threaded and connected with the upper part of the connection. It is graduated to $\frac{1}{1000}$ inch, thus allowing the operator to keep a record of the setting of dies, a feature which results in saving of time and insures uniformity of work. The shaft is made of tough steel forged to shape. The clutch is of new design and is based on the principle of a sliding bolt, moving at right angles to the axis of the crank shaft. It can be quickly locked to allow the setting of dies without throwing off the belt. Its construction is such as to prevent any repeating of the

press or self starting. The die space is larger than usual, particularly as to height. The slide is large and broad and is guided in scraped V gibs, one of which has an adjustment for taking up wear. The hole or recess for the shank of the punch is made square.

The Treatment of Tool Steel.*

A few words relative to hardening steel with a soft center. It is found, however, by experience that an immersion in cold water and allowing it to remain there no longer than is sufficient for hardening the outside to a proper depth can only be learned from observation, as the toolsmith must be guided entirely by the bulk of the article to be hardened and a hissing sound which the steel produces in the water while cooling. This certain sound, and at times a tremor, indicates the effect to be produced. As soon as he discovers the effect by the above process, the steel should be immediately taken out of the water and immersed in oil.

The oil will prevent the outside from becoming soft and retain a soft center. This in a measure applies to articles of small dimensions, large pieces being hardened only to a certain depth from the surface and if properly heated, by reason that the heat in the interior cannot be extracted quick enough. In my opinion the immersion in oil is beneficial, for the reason that it will allow the particles a longer time to arrange themselves than if cooled in water. In order to substantiate this theory let us take a thin piece and cool it in cold water, and we find that it will crack or warp. Now, the same article cooled in oil will not crack and will warp only slightly. The reason is obvious. Oil is a slow conductor of heat and allows the particles to assume their normal state in a manner to which they are naturally disposed, hence the first operation in water will take care of the exterior of the steel, the second the oil takes care of the interior and prevents the outside from cracking by giving the steel time to cool uniformly. The danger of cracking increases when the parts are unequally thick; by that I mean when they are irregular in their cubical contents, which prevents the heat from escaping simultaneously.

A word in regard to forging tool steel. For the first, care should be taken as to the uniform and proper heat in order to prevent a partial dislodgment or encroachment of the particles, which if injured can only be remedied to an extent by proper annealing, and if there has been an appreciable amount of irregular heating and forging under an irregular heat the danger cannot be compassed even with annealing. Steel is extremely sensitive and varies with each degree of heat, and with the variations it will set itself accordingly when cold. My opinion is that the only thing that will adjust the particles to their normal condition is to heat uniformly and treat to a force sufficient to cause the particles to flow as simultaneously as possible while under the sledge or steel hammer. Irregular heating under the influence of force will create a tension, and if the tension is too great to be removed by annealing the steel will be liable to fracture in hardening; yet it might endure the hardening process and still be imperfect and subject to stress not noticeable until put to use. Bear in mind the stress is there just the same, but the conditions have not been severe enough to bring out the fracture.

Now, just a little more agitation, a severe wrench and away goes your tool.

The atomic bonds have been destroyed through abuse, and all on account of the ignorance or carelessness of the toolsmith, who has caused a rupture of the particles by bad heating, bad working and bad hardening. To prevent this trouble and loss is it not necessary to have men who have this important duty to perform to study this question in all its bearings?

Big Dredge for Russia.

United States Consul Alfred A. Winslow of Liège, Belgium, has furnished to the State Department some details regarding an unusually powerful dredge that has just been built for the Russian Government by the Société John Cockerill at Seraing on the river Meuse. The dredge is constructed on the principle of the dredge "Beta," in use in the Mississippi, but is very much larger, being able to remove 4000 cubic yards of sand, gravel, clay or similar material per hour to a distance of 700 feet. It is to be used in digging the ship canal to connect the Baltic Sea with the Volga River. The earth is cut up and mixed with water by revolving trepans, until it is of a consistency that can readily be forced up by two powerful steam pumps of 1428 horse-power each. The dredge is 214 feet 6 inches long, 61 feet 6 inches wide, and when ready for work draws 4 feet 6 inches of water. It can excavate a

* From a paper read by G. F. Hinkens before the National Railroad Master Blacksmiths' Association.

channel nearly 80 feet wide and 14 feet deep at one cutting. The fuel used is naphtha, and when the dredge is in full blast it consumes about 1200 gallons per hour.

San Francisco News.

SAN FRANCISCO, March 6, 1899.—There is quite an activity in hardware, iron and steel which has no relation to any consumptive demand present or prospective. The steady advance in Eastern markets has at last reached here, though prices had been advancing slowly for some time past, in fact since January 1. The average advance in the market has been 15 per cent., it being a great deal more in some articles or a good deal less. In some the advance during the past week has been phenomenal, prices jumping up heavily in one day. A good many people had made arrangements to meet this advance. They were provident and had made their purchases when the markets of the East first began to boom, and these are now congratulating themselves on their forehandedness. They will make a good deal of money for some time to come. Among these are a few of the retailers, though most of those benefiting belong to the wholesalers, jobbers and manufacturers. For these for various reasons the year has been a favorable one. Of course most of the benefit of the advance will inure to the credit of San Francisco. Here is concentrated most of the capital invested in the business, and, in fact, through the medium of our banks it may all be said to come originally from this city. In nails there has been a jump of 25 cents per keg in a few days. Cut nails, iron and steel, are now \$2.25 as against \$2 previously, while wire nails have advanced to \$3.10. There has been more or less speculation in these articles, and thus for a while an increased amount of activity has been noticeable. This mild excitement takes the place of a spring trade. It is, however, but a passing ripple on the great ocean of business.

We are now on the threshold of the business year, and it is still very much of a conundrum as to what the character of that year will be. We are in the first days of March, which came in like a lion—that is to say, March 1 was a day of soaking rain. A rainy day, but the rain did not last, and now the old apprehensions are as strong as ever. There is no question that the crops are in serious danger, and the outlook at present is not at all reassuring. With another year of short crops it will be bad for trade generally. Outside of California crop prospects are very good indeed, and the rest of the coast would make up the loss somewhat, but not to San Francisco.

The Government is still buying largely here, and every steamer that leaves the harbor is laden with supplies purchased in this city. The trade in hardware and iron and steel has had a share of this business, although the main part was made up of groceries and provisions, clothing, &c. The transports that have cleared during the past two weeks have so swelled the clearing house exchanges that the latter for the week ending Saturday, March 4, were \$21,297,818—an unusual figure for any time of the year and especially for the beginning of March. The clearings for the corresponding week in 1898 were only \$17,435,514, showing an increase of 22 per cent. nearly. The month of February, too, shows a large increase over February, 1898, the figures for that year being only \$60,052,611, while those for February of this year were \$63,062,576—about 5 per cent. more. Seeing that we are threatened with another dry year that is a very good percentage of increase indeed. Many, however, look forward to a year like 1890, where with similar unfavorable conditions at this period of the year there came tremendous rains in May, which were followed by a crop the like of which has not been seen in the State before or since. There are too many elements of uncertainty to make the occupation of a weather prophet in California either pleasant or profitable. Three days' rain would put everything in good shape again, and would give quite an impulse to the regular trade of the year proper to this time.

We want bigger shipyards on the coast and more extensive plants. The Oceanic Steamship Company are about to have three large steamers—much larger than those at present employed in the trade for the carrying business to Australia, New Zealand, Fiji, Samoa, &c. The reason that these were not built here and such a large amount of money spent in the city is that the present establishment has too much work on hand, and these must be finished within a year. The contracts will, therefore, go to the Cramps, who built the vessels that are now on that route. The new steamers will make much better time. The steamers now take from \$90,000 to \$110,000 worth of merchandise on every trip—that is, about \$1,250,000 a year, of which no inconsiderable proportion is Eastern merchandise in transit. This last takes in a good deal of hardware, some machinery, a good many bicycles, &c. There are some agricultural implements. Of late they carry a great deal of merchandise for Honolulu, for which port they used to take very little. A service of, say, 20 days by powerful steamers would have a wonder

ful effect in quickening trade. One complaint here has been that it could never be known when an order would arrive at its destination, not from any dereliction of duty on the part of the officials of the company, but simply from the fact that the steamers were not of sufficient size for the trade. Machinery or other supplies would be left over on the wharf for the sailing of the next steamer when they were due by the one that was about to sail and when the validity of the order depended on prompt delivery. For instance, if a mill were not delivered on time, the owners of the mine would look elsewhere for their supplies. Under the new order of things the steamers would make more frequent as well as faster trips, while each one would carry a much larger amount of merchandise than those now on the route. There should be a great demand for San Francisco and Eastern mining machinery and for Eastern hardware, when a quick, short and altogether reliable service had been established. American hardware has always had the call in the Australias on account of its superior lightness and adaptability to the purposes for which it was intended.

There has been a great amount of good done to the trade by the Pacific Coast Hardware and Metal Association. Favorable freight rates have been obtained from the Southern Pacific Railroad to the various parts of the coast reached by its lines, and the same has been done in the case of other lines of road on this coast. The result of this has been to extend the trade of San Francisco and other large trading centers on this coast and to enable the dealers to hold their own in the fierce competition given in their own field by the wide awake traders of the East, particularly of Chicago and other live centers of business. Not the least beneficial is the change opened out to all wholesalers and jobbers to bid on Indian supplies and Government business generally. This was closed practically to the Pacific Coast people till the organization of this association. If it had never done anything else it would be entitled to the everlasting gratitude of the trade and the Government. The former get their share of the business, the latter have the supplies delivered quicker and cheaper than under old methods, when everything had to be referred to the departments in the East and when goods needed for this side of the continent had to be got from the other. The association has brought harmony into the different branches of the business, and without attempting in any way to dictate matters of price and so on has had estimates from all its members as to the cost of doing business, whereby one can benefit by the experience of the other. This in itself leads to more uniform prices, and establishes a system of reasonable profits in all the branches of the trade. It will tend measurably to allay the complaints of retailers set forth with such force not long since. It essayed some time since to promote a uniform system of railroad freights by which the Canadian Pacific would charge somewhere in the neighborhood of the other roads—for the Canadian Pacific is a big corporation, supported by Government money, and if it is in any difficulty the Government comes to its assistance. Our roads having to charge higher rates, goods can be had here much cheaper via Canadian Pacific, and thus our merchants are left with a lot of goods on their hands or are obliged to sell at a loss. In this, however, the association, aided by other commercial bodies of San Francisco, has not been able to do any good. The officers of this association are among the leading men in the trade on the coast.

J. O. L.

United States Consul-General Beaupré, at Guatemala City, Guatemala, has collected for the State Department at Washington some data of considerable interest relative to the cultivation of rubber. He has obtained statistics from a reliable authority showing that the net annual profit from rubber under proper cultivation will be much greater than that which coffee under the best and most favorable circumstances can yield. His report to the State Department incloses an article on rubber culture prepared by an experienced rubber grower, which gives in succinct form not only the history of the development of the uses of rubber, but a complete description of the methods of cultivation practiced in Guatemala, and statistics showing the cost of production. It is shown in this report that with an outlay of \$115,000 an annual return in profit of \$83,000 can be realized.

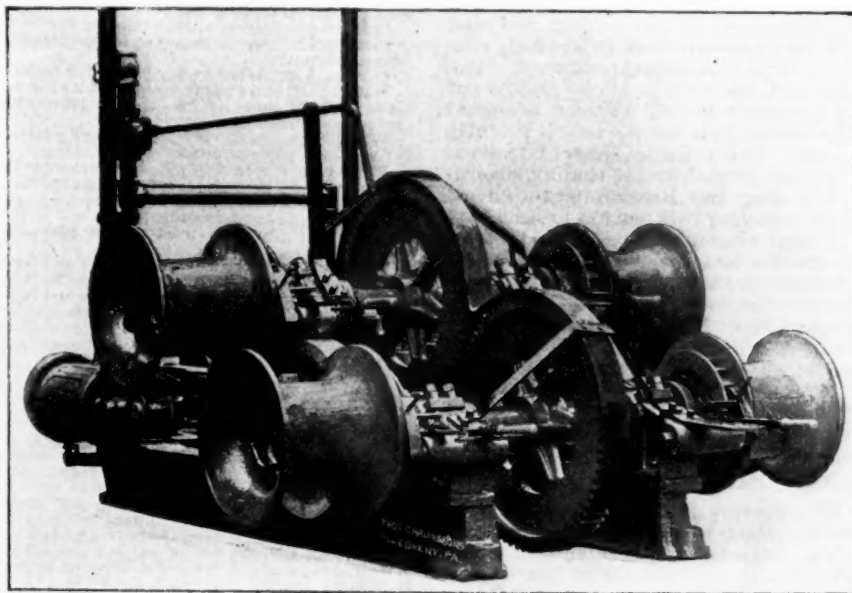
Intending exhibitors at the coming convention of the American Foundrymen's Association, to be held in Pittsburgh during the third week in May, will please communicate with Dr. R. Moldenke, Forty-eighth street and A. V. Railway, chairman of the Committee on Exhibits. Applications for space will be received up to May 1.

The exact amount of the appropriation by Congress for the Paris Exposition is \$1,210,000. As the original appropriation was \$650,000 this is an increase of \$560,000. Of the amount appropriated, \$200,000 will be expended on the United States buildings and \$150,000 will be used in the display in the agriculture and horticulture department.

The Carlin Four-Spool Erectors' Engine.

A new four-spool erectors' engine has been put on the market by Thomas Carlin's Sons of Allegheny, Pa. The engine from which the engraving was made has two 8 x 10 inch cylinders placed on a narrow bed plate made of somewhat greater depth than usual. The spools, or cat heads, are turned to an approved form, which allows the lifting of heavy loads with a minimum wear on the rope and without its being liable to climb or bind when paying on or off. Each spool runs independently, being held in or out of gear as desired by a heavy pawl engaging a ratchet bolted to each spool, a shroud being cast on it to keep the pawl in place. The spools have oil recesses, with provision for oiling from the outside. The connecting rods of the engine have solid forged ends, with large bearings on their steel wrist pins, the wear being taken up by wedges and screws. The bearings on all the shafts are ample and are lined their whole length with babbitt metal. Their caps are placed on an angle so that the greatest strain is on the stands proper. They are fitted with lever cylinder drain cocks, closed top oil cups, sight feed lubricators, quick opening throttle valve and globe valve. The machine weighs 6800 pounds.

The workmen at one of our greatest wire rolling plants had a curious experience lately with aluminum. An order



THE CARLIN FOUR-SPOOL ERECTORS' ENGINE

was received for rolling 100 tons of aluminum wire rods. After being instructed in the proper heating the work progressed exceedingly smooth and the output looked tremendous. But when the reports of the tonnage rolled at the end of the first day came in there was universal consternation and much doubting. The weights were verified and brought the proof that at existing tonnage rates for labor in rolling the earnings of the men were exceedingly slim. In fact, the tonnage rates were finally adjusted on the basis of about six times those for steel.

Some prominent Pittsburgh capitalists, including H. W. Oliver, A. W. Mellon, P. C. Knox, Chas. Lockhart and others have taken interest in the shipbuilding plant that is being organized by Henry G. Morse, formerly of the Harlan & Hollingsworth Shipbuilding Company, and also the Edge Moor Iron Works of Wilmington, Del. It is stated that the company will be capitalized at \$12,000,000, and will erect large shipyards on Chesapeake Bay. It is also stated that no subscriptions less than \$50,000 have been accepted.

One of the results of the recent inspection of the Baltimore & Ohio Railroad lines west of the Ohio River is an order for a double track on the Central Ohio division from Bellaire to Cambridge, Ohio, a distance of 53 miles. It is stated the additional tract will cost about \$1,250,000, and a number of heavy grades between Bellaire will be cut and all the bridges will be replaced with new steel structures.

Lloyds' statistical tables for 1898, just issued, show that during the year the United States acquired 42 British vessels of 118,857 tons aggregate capacity.

Naval Matters.

WASHINGTON, March 14, 1899.—In spite of the wholly unsatisfactory form in which the annual Naval Appropriation bill was passed by Congress in the closing hours of the session just ended there is good reason to believe that there will be little or no delay in the work of constructing the 12 war ships authorized by the measure. It is believed that by the time the Fifty-sixth Congress meets the situation will be so thoroughly understood by the majority in both houses that there will be little difficulty in correcting the blunders made by the Senate in the measure just enacted.

The new law provides for the construction of 12 vessels, including three battle ships, three armored cruisers and six protected cruisers. The battle ships and the armored cruisers alone will require armor, so that the limitation placed upon the Department restricting the cost of armor to \$300 per ton applies only to these vessels, and not to the protected cruisers, in which the only plates employed are deck plates, which are furnished by the contractors. Since the passage of the naval bill the Secretary and his aides have had a number of conferences, as the result of which the Department is now prepared to push with all speed the preliminary work upon the 12 war ships. As to the outlook for the construction of these vessels, Commodore Hichborn of the Bureau of Construction said to the correspondent of *The Iron Age*:

The Armor Muddle.

"A careful estimate shows that the armor for the battle ships and the armored cruisers recently authorized by Congress will not be required for the next 18 months at the earliest. Captain O'Neil of the Ordnance Bureau states that the armor plate manufacturers are now occupied with orders which will keep them busy until next February, so that even had Congress authorized us to make contracts immediately at a price acceptable to the manufacturers we could not have secured any deliveries for many months to come. The recent action of Congress makes it necessary for us to look to the next Congress for relief, but if we can count upon legislation that will enable us to make contracts for the ships by the first of next year and for the armor by a year from next July, I believe there need be no delay whatever in the construction and final delivery of the new ships. The form of contract which the Department now makes for the construction of vessels contemplates a number of important contingencies which were not formerly regarded as necessary to provide for. Under the contracts which we now make we can complete the six protected cruisers in every detail, and we can finish the armored cruisers and the battle ships with the exception of their armor, and can receive them from the contractors, give them their speed trials and lay them up at our own docks, so as not to incur any damage because of delay while in the contractor's hands. These points are especially important in view of the situation in which the Department finds itself by reason of the peculiar legislation recently enacted. Of course it will be understood that the Department will not be at liberty to invite bids for the battle ships and the armored cruisers until we have let the contracts for the armor

plate, but we can go ahead with the work of perfecting the plans, and immediately after an agreement is reached on the armor plate we can begin the construction of the vessels, so that while the armor is being made the ships can be built. A great saving in delay may be secured if Congress, without reference to the controversy concerning the price of armor, should, by a joint resolution or otherwise, give us the right to begin the construction of the ships without regard to armor. In that case we should lose absolutely no time, for in view of the many important changes that will be made in the new vessels the next eight or ten months can be very advantageously devoted to working up the plans."

No Government Armor Plant.

A statement has been in circulation within the past week to the effect that the Department has been figuring upon the cost of a Government armor factory in connection with the large quantity of armor which Congress has authorized, including plates for the "Maine," "Ohio" and "Missouri," the four monitors authorized a year ago, and the three new battle ships and armored cruisers included in the last appropriation bill. It has been said that the difference between \$300 per ton, the estimated cost of armor produced in a Government factory, and \$545 per ton, the price demanded by the armor manufacturers, on all the armor required for these 13 vessels would be at least \$3,000,000—a sum almost adequate to the construction of a plant. It is argued that if the difference should be thus spent the Department would thereafter be independent of the private manufacturers. It can be stated on the highest authority that no bureau of the Department has made any formal estimates on this project, and that there is no disposition in the Department to seriously consider the construction of a Government factory. The Secretary of the Navy and the officers of the Bureau of Construction and of Ordnance are all disposed to regard \$545 as a fair price for armor plate for the vessels recently authorized by Congress. The price is believed to be at least \$30 less than the average paid by the leading governments of Europe, including the Russian Government, which is understood to be paying \$579 per ton to American manufacturers for Krupp armor. If the United States Government can secure the best armor that can be made at a less price than foreign governments are paying their own and other manufacturers there will be no disposition in the Navy Department to find fault. Under these circumstances it is not difficult to understand that the Department is not giving any consideration to the proposed Government factory scheme, which, indeed, would require direct authority from Congress before the Department would be privileged to build the plant, even could the funds be taken from the armor plate appropriation.

The New Battle Ships.

The Bureau of Construction has already begun working out the plans for the three new battle ships, and in a few days their leading features will be submitted to the Secretary of the Navy for his approval. The vessels will have a total displacement of 13,500 tons, or about 1000 tons larger than the "Maine," "Missouri" and "Ohio," which were authorized last year. They will thus be the largest vessels in the American navy and equal in tonnage to the most approved type of battle ships now being built by the great naval powers of Europe. The general lines of the "Maine" will be followed in the new battle ships, the only difference being in slightly increased dimensions. Their batteries will be a great advance over those of any battle ships thus far constructed. Each vessel will carry four 12-inch guns in turrets and in penetrative power quite equal to the 13-inch guns of the Oregon. The batteries of eight 8-inch guns mounted on the Oregon have been abandoned for 16 6-inch caliber rapid fire guns and 20 6 pounders. This distribution is the result of a very close study of the lessons derived not only from the recent war but also from the observations of American naval experts during the Chino-Japanese war.

The speed of the new battle ships will be full 18 knots, a theoretical advance of 2 knots over the "Oregon," as that vessel is said to have made 17 knots during the portion of her run in chase of the Spanish fleet off Santiago. It will be remembered that the "Maine," "Missouri" and "Ohio" are also planned for 18 knots speed, so that upon the completion of all the ships now authorized the United States will have six first-class battle ships capable of making 18 nautical miles per hour or better.

Without regard to the recent legislation of Congress, the new battle ships will be planned to carry Krupp armor of the most superior quality, and while the superior resistance of this armor will enable thinner plates to be employed, the Department will not decrease the total tonnage of the armor, but will take advantage of the difference in weight to protect certain parts of the ship which have not heretofore been covered. The battle ships will carry a belt of armor 7 feet 6 inches broad, 3 feet 6 inches above and 4 feet below the water line. In the original plans for Harveyized armor this plate would have been 16 inches thick, but because of the increased resistance of Krupp

armor it is now proposed to decrease the plate to 12 inches. The casemates, however, which were originally designed to have a thickness of 5 inches, will be made 7½ inches thick.

Tests of Armor Plates.

In this connection Chief O'Neil of the Bureau of Ordnance has prepared a very interesting table, designed to illustrate the difference between the tests now applied to Harveyized armor and those that would be applied to Krupp plates. These calculations have special importance, as the Department proposes to incorporate them hereafter in all contracts for armor plate, and they are therefore here presented in the form of specifications:

1. Caliber of gun.	2. Thickness of plate.	3. Foot- inches.	4. Foot- seconds.	5. Foot- seconds.	6. Foot- seconds.	7. Foot- seconds.
4-inch.....	4	1,318	1,819	1,529	2,180	1,676
	5	1,541	2,127	.....	2,577	.....
	6	1,750	2,415	.....	.....	.....
5-inch.....	5	1,482	2,045	1,754	2,343	1,717
	6	1,684	2,324	2,016	2,683	1,904
	7	1,366	1,885	1,647	2,078	1,659
6-inch.....	6	1,522	2,100	1,848	2,333	1,816
	7	1,671	2,306	2,042	2,579	1,968
	8	1,313	1,772	1,579	1,884	1,559
8-inch.....	9	1,426	1,925	1,725	2,258	1,672
	10	1,535	2,072	1,867	2,227	1,786
	11	1,641	2,215	2,005	2,392	1,897
	12	1,285	1,735	1,573	1,760	.....
10-inch.....	11	1,373	1,853	1,687	1,801	1,595
	12	1,459	1,970	1,800	2,019	1,685
12-inch.....	12	1,278	1,687	1,545	1,696	.....

Column 3 is the velocity for perforation of homogeneous steel by De Marre formula.

Column 4 is the velocity proposed for ballistic test for Krupp armor, uncapped projectiles.

Column 5 is corresponding velocity for capped projectiles.

Column 6 is velocity required for perforation face hardened armor (bureau formula).

Column 7 is present high velocity for ballistic acceptance test.

With 6-inch gun the proposed velocity for acceptance test of 6-inch plate is about same as for 7½-inch plate of high velocity shot of present specifications.

With 8-inch gun the proposed velocity for 8-inch plate is the same as for 10-inch plate of present specifications.

With 10-inch gun the proposed velocity for 10-inch plate is the same as for 12½-inch plate, present specifications.

With 12-inch gun proposed velocity for 12-inch plate is same as for 15-inch plate, present specifications.

The 4-inch gun to be used against plates below 5 inches in thickness.

The 5-inch gun against 5-inch plates and below 6 inches.

The 6-inch gun against 6-inch plates and below 8 inches.

The 8-inch gun against 8-inch plates and below 10 inches.

The 10-inch gun against 10-inch plates and below 12 inches.

The 12-inch gun against 12-inch plates and above.

The bureau reserving the right to use a gun of smaller caliber with correspondingly increased velocity.

The ballistic test to be three shots, with velocities as given in column 5, no shell or part thereof to fall in rear of skin plate and no through crack to develop. In case of perforation by capped shell, no through cracks developing, uncapped shell shall be used in such number as shall make the number of impacts at least four, the velocity of such uncapped shell being taken from column 4, the acceptance or rejection ballistically of the group of armor represented by the plate being determined by its resistance to such attack under the same conditions as noted above for capped projectiles, each point of impact being at least 3½ calibers from each other point of impact and at least the same distance from an edge.

The data for the use of capped projectiles are taken only from information derived from the tests of armor treated by the face hardening process now in use. It is believed, though, that the velocities for heavy armor should be increased, as with a thicker hard face the cap will lose to an extent, the limit of which can be determined only by experiment, its value.

The New Cruisers.

The six new cruisers authorized by the naval bill will be constructed upon the general model of the "Marblehead," but will have many improvements in addition to being 600 tons larger than vessels of that class. A marked feature of these cruisers will be a largely increased coal capacity, in addition to more effective batteries. They will be sheathed with wood over the steel hull and coppered, the purpose of the Department being to so construct them that they can keep the seas for long periods without docking, so that they may render effective service on foreign stations where a comparatively small vessel is all that is necessary to safeguard American interests. These ships will have a displacement of about 2600 tons, and in building them an important consideration will be time in their delivery, as the Department is greatly in need of several such vessels at the present moment. It is realized that if this Government is to maintain indefinitely naval stations in the Philippines, the Hawaiian Islands, Porto Rico, &c., it is important that we should have a considerable fleet of small swift vessels capable of remaining on station a long time without undergoing the expense and loss of time incident to frequent docking.

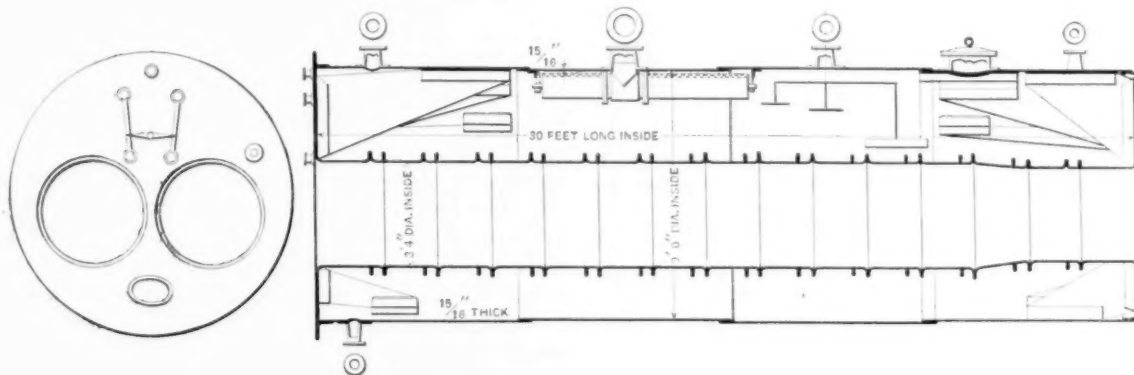
Some anxiety has been caused by the discovery of an error in the Naval Appropriation act in the provision relating to the purchase of Harveyized armor for the battle ships "Maine," "Ohio" and "Missouri." These vessels are authorized under last year's act, but this year the armor for them was included in the annual bill, and the Senate made a concession from the \$300 limitation intended to enable the Secretary of the Navy to pay \$400 per ton for the plates for these three ships. Under the phraseology of the last act, as it was passed, the \$400 rate appears to apply to vessels authorized elsewhere in the same act instead of in the previous act. The law officers

of the Navy Department, however, are disposed to believe that the intent of Congress is sufficiently well understood to obviate any controversy regarding the exact terms of the law.

W. L. C.

Large Boiler Plates.

British builders of boilers of the Lancashire type have of late years been steadily increasing the size of the plates used. At the present time the largest plates on stationary boilers are just under 8 feet wide and each ring is formed of one plate only. The *Engineer* states that some manufacturers contemplate making them 12 feet wide. The illustration shows a boiler constructed recently in England which measures 30 x 9 feet inside, and has flues $3\frac{3}{4}$ feet in diameter, with the last two rings tapering to 3-1-3 feet at the back end. It will be noticed that this boiler is composed of only four plates,



LARGE BOILER PLATES.

thereby reducing the number of riveted joints. The plates were specially rolled. They measure 29 feet $\frac{1}{2}$ inch long by 7 feet $9\frac{1}{2}$ inches wide, and are 15-16 inch full thick. They are believed to be the largest plates ever used in a Lancashire boiler. The end plates are all in one piece, and are 10 feet $3\frac{1}{2}$ inches and 9 feet $11\frac{1}{2}$ inches in diameter respectively, their edges are turned and the flue openings cut out in the lathe. The circumferential seams are riveted with a double line of rivets, as also are the front and back ends, the front plate being riveted to an angle ring, while the back plate is flanged cupwise by hydraulic press at one heat. The butt straps of the rings, which are $\frac{7}{8}$ inch thick, are very securely riveted, the joints of the two inside rings having eight rows and those of the outside rings six rows of rivets. The joints in the outside rings, coming as they do between two gusset stays, do not require the two extra rows of rivets. There are five gusset stays above the flues on both front and back plates. They are made of 15-16-inch plate. The first and third rings of plates from the front of the boiler are external to the second and fourth rings. The flues each consist of 15 rings, each formed of one plate 19-32 inch thick—the front and back rings forming the attachment to the end plates being 11-16 inch thick. There are no cross tubes in the flues. The longitudinal seams of the flue rings are welded. All joints are calked inside and out with pneumatic hammers.

The makers originally guaranteed that the boiler should pass any boiler insurance company for 180 pounds working pressure. The National Boiler & General Insurance Company examined and tested the boiler, and considered it to be suitable for a working pressure of 200 pounds on the square inch—i. e., more than 10 per cent. in excess of the guarantee. The boiler was tested up to 300 pounds per square inch, with hydraulic power, no less than 14 times. During all the tests the boiler was practically drop dry. This would point to the fact that even at 300 pounds the limit of elasticity had not been approached, while under pressure the average deflection was 1-16 inch, and in no part exceeded 3-16 inch. The total weight of the boiler without fittings is 38 tons.

A cable dispatch reports that M. Secretan, founder of the Société des Metaux de Paris and chief agent of the famous "copper ring" of 1888, died on March 12.

A contract has been closed by President Monsarrat of the Hocking Valley Railroad for two ore handling plants for the docks at Toledo, Ohio, which will be the most complete of their kind on the great lakes.

A Steamship Brake.

A Croatian engineer named Czvetkovich has invented a patent marine brake by the use of which he claims collisions at sea, such as that which sank the British man-of-war "Victoria" some years ago, can be averted. The device, which is very simple, is thus described: The brake consists of a large curved plate of steel attached to the stern of the steamer, which can be lowered at will into the water. The screw of a steamship, it should be explained, when working ahead causes a stream of water of terrific force to flow back in the direction from which the ship has come, and by lowering the plate of steel into this stream the power is obtained necessary to check the ship's way and bring it to a standstill independently of the engines. Since the stream caused by the screw is of greater force when the ship is steaming fast, the brake would work equally well whether the speed were 20 knots or 10

knots. The "Clotilde," a steamer of 1000 tons, when steaming at a speed of 10 knots was brought to an absolute standstill within 30 seconds, during which she traveled so slowly that only 20 feet were traversed after the brake was applied. This result was obtained in spite of the fact that the engines were working full speed ahead the whole time.

New Niagara Power Punch.

Our engraving shows one of a new line of power punches being introduced by the Niagara Machine & Tool Works of Buffalo, N. Y., which are intended for punch-



NEW NIAGARA POWER PUNCH.

ing round holes in sheet iron. The motion is controlled by a positive clutch, which causes the plunger to stop at the highest point after making one stroke, or by keeping the treadle depressed the plunger will make continuous strokes. A stripping attachment and gauge are provided, and the dies and punches can be exchanged quickly. The throat is made 4, 6, 10 and 15 inches deep, and the machine will punch holes $\frac{1}{4}$ inch diameter through iron $\frac{1}{8}$ inch thick. Similar machines are made in heavier patterns and back geared that will punch a hole $\frac{3}{8}$ inch diameter through iron $\frac{1}{4}$ inch thick.

The Iron Age.

New York, Thursday, March 16, 1899.

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England's Foreign Trade and Our Own.

The growing excess of British imports over British exports has given rise lately to much speculation as to the cause, and also the possible effect upon the prosperity of that country. According to the "balance of trade" theory, often quoted on this side of the ocean, no country can import more than it sells abroad without inviting ruin. It happens, however, that the imports into the United Kingdom long have exceeded the exports of British produce, and it remains to be shown that the nation is growing poorer. Just how much of Great Britain's imports represent returns from investments of capital abroad or how much the earnings of British shipping it is impossible to say. Only with such data at hand, perhaps, could one determine whether or not England has fared well as the result of a year's trading abroad, but in any case something more is needed than statistics of foreign trade to make up a nation's balance sheet.

In our own country the import and export trade is apt to receive an amount of consideration out of keeping with its importance as compared with the internal trade of the country, if for no other reason than that trustworthy details may be obtained more readily with regard to the former. The customs authorities report on the quantity and value of every article passing through their hands, while the greater part of the products of the farm, mine, forest and factory go into home consumption with no adequate statistical record. Even the national census reports are defective, besides being delayed always until they are ancient history. Our exports of merchandise, amounting now to \$1,250,000,000 in a single year, seem large, but this is less than \$17 per capita—not more than the pay of a good wage earner for a week. Consider the scale of living of all classes in America, and it will be seen that the average annual home consumption of materials which enter into our trade and industry must be many times greater than \$17 worth per capita.

In Great Britain also the foreign trade falls far short of the home trade in value, though some conditions there differ from our own. Partly because many lines of manufacture were developed earlier in England than elsewhere, partly because they must depend largely upon foreign raw materials, partly because of her supremacy as a marine power, the foreign trade of Britain has come into such close relation to every other interest that the general prosperity there is bound up with the import and export movement. Hence the records of the latter, in the absence of statistics of the home trade, are the common measure of prosperity or adversity. The export trade of Great Britain is still relatively of more importance than in any other industrial country, and, owing to her smaller population, is much larger per capita than in the United States. Yet not the least important demand upon British manufacturers is that which is growing all the while within their own country, just as the most important demand which confronts the American

producer in nearly every line is that of the home buyers.

This is not written to disparage foreign trade, but to point out that, no matter how much the exports of manufactured goods may increase, from either country named, they must still be small as compared with the home consumption. Apart from the question of a large demand at home, there are certain circumstances in favor of the domestic trade. The home demand is more easily understood and more easily filled with satisfaction; there is the advantage of proximity of seller and buyer, which often is of great help in promoting trade; by doing business at short range, one may hope for a more frequent turnover of capital at a profit; and certain risks are avoided when all the details of business are confined at home. Still the building up of foreign trade, if on a sound basis, adds to the wealth and power of the nation, while it may serve an important purpose in helping to keep prices regulated, when, without exports as an outlet for surplus production in a season of dullness in home buying, prices would sink to an unprofitable level.

Whether trade is sought at home or abroad, an encouraging feature of the industrial situation is the constantly increasing demand for nearly every form of production, and the fact that, taking the world as a whole, the demand for goods keeps up with the increase in productive capacity. When the United States had become so well provided with railways that apparently no room existed for another line, the great development in iron production which had been necessary in supplying the rails and rolling stock did not halt. The development of electrical street car systems in cities began soon, to say nothing of the use of iron in tall buildings, in bridge construction on a larger scale, and in machinery in new forms and for new purposes. The standard of living tends constantly upward, demanding new articles of comfort or convenience, all of which call for new machines for their construction, since practically nothing is made by hand now. Each new want, or demand, makes additional opportunities for work, under conditions which enable workers to acquire some sort of surplus, and thus each generation lives better than the last one before.

These conditions do not apply alone to any one country. The building of steam and electric railways is extending on every continent; mining operations in places recently inaccessible are carried on with machinery of the latest and best types; there is scarcely a corner of the globe which has not been reached by the telegraph, printing press, typewriter and sewing machine. The tendency in each country is toward the highest standards to be found in any other, and to make of the whole world one market for industrial products. Overproduction is less liable to occur in any locality, now that every manufacturing country seeks customers all around the globe, while buying countries look for the market in which purchases may be made on the best terms. Fortunately for the manufacturers, it would seem that the more the world buys the more it can afford to buy, so that the work of production goes on as if such a thing as reaching a limit were impossible. If we Americans can gain a large share of the demand for goods abroad, taking care that each order is filled at a profit, the country is sure to benefit by it, no matter how our "balance of trade" may appear, or what political wiseacres may have to say. We take it that the same is true of the trade of England.

Because England is now mistress of the seas, and

her foreign trade is so large, it does not follow that her pre-eminence in either regard will be lasting. Every country capable of progress in manufacturing under modern conditions is a possible competitor with Great Britain; every new ship launched by another country lessens her relative sea power. Yet this does not mean the total decline of England, but that other countries will share in filling the growing demands of the world for manufactured products and for transportation.

What Will Check the Demand?

The rapid enhancement of prices is by no means giving general satisfaction. Even those who seem to be profiting most by the rise in values are not serenely happy. They, of course, feel better than when they were striving not long since to make both ends meet. But if they had their choice probably not a dissenting voice would be heard to the proposition that a moderate volume of business at a reasonable profit would be desirable and preferable. The change has been so rapid that all calculations are upset. Some producers are loaded far into the future with low priced contracts. These must be filled even if margins are cut down by higher wages, dearer materials and advanced freight rates. When a sale is made it is impossible to cover all elements of cost, no matter how capable the management may be. A great deal of business is thus in progress of completion which is affected adversely by the decided change in market conditions. The prices now being realized are making old contracts exceedingly burdensome. Few manufacturers are so fortunate as to be entirely free from obligations of this kind, so that they can immediately reap the full advantage of every rise in values.

The question which is now on every tongue is, How long will the upward movement continue? To which the only answer is, either until consumption is checked by the conservatism of buyers or production is stimulated beyond the point of meeting the demand. It may be safely assumed, we think, that so thoroughly has a belief in permanently low prices been implanted in all business circles by the events of the past six years that a point may soon be reached in the upward flight of prices which will cause buyers and consumers to try to get along for a little while without buying any more. Contemplated improvements may be not only checked, but may be completely shelved to await the return of a cheaper era. A 10 per cent. advance may stimulate business, and a 25 per cent. advance may cause some wild buying, especially among those who need material to fill contracts, but a 50 or 100 per cent. jump is likely to induce reflection and possibilities of economy or substitution. If values were to settle on their present basis and be maintained there for a few months, another process of education would set in which would prepare the business world to regard advances from that plane with approval and perhaps with no special anxiety. But to soar in an unbroken flight from the lowest prices on record to the level of boom periods certainly means a sharp restriction of consumption as that level is approached.

No man, however, and no set or class of men, can check a movement of this kind by preaching conservatism. We have seen how strenuously the leading manufacturers endeavored to check the rising tide by taking contracts for all kinds of materials at such low prices that constant surprise was elicited because

the huge volume of business apparently had no effect on values. At the same time assurances were being given quite authoritatively that no danger of a scarcity in iron and steel need be apprehended, as the capacity for production was so enormous. But this capacity was gradually taken up, and we have now been treated to the spectacle of a market without a regulator, bound no one knows whither. It is not like 1879-1880, because at that time America was the sole buyer and Europe was an eager seller. Great Britain had enormous stocks of pig iron, from which shipments were made to us in such quantities that the scarcity here was speedily supplied. The world is now bare of stocks everywhere, and Europe is drawing from our producers instead of helping to supply our deficiency.

Under these circumstances, what is a buyer to do? How shall he know when a safe limit is reached in prices? He can only watch the market carefully and look for signs of economy among the people generally. The value of any commodity is what it will fetch, and as long as it continues to move the price is not too high. This limit may be reached far above the present range of prices, or it may be only a little above. No one can tell. But those only will reap the full advantage of present conditions who are both confident and watchful. The past has gone completely, and its traditions should be swept out of memory in trying to solve the problem of to-day's conditions.

Prices and Profits.

There is some danger that the exact position of the iron manufacturers of this country may be misunderstood, and that they may be given credit for making altogether much more money than they are really doing. That reputation is a little inconvenient in many ways. Stockholders expect too much, the railroads are likely to be too precipitate in advancing freights, and the men may reach the conclusion that they are not fully participating in the revival.

With a few fortunate exceptions the active wire and steel plants in this country loaded up with low priced contracts for the first half of the current year during the closing months of 1898. In fact, prices have soared chiefly because an unfilled surplus demand found the majority of sellers committed for many months to come. In fact, many large concerns, anxious to prevent what finally proved to be beyond their control, went on selling heavily to keep values down.

We need only refer to the enormous sales of steel rails at low prices for 1899 delivery, to the heavy contracts for delivery up to September entered into by individual tin plate companies prior to the consolidation, to the very large transactions closed for domestic and foreign account by Southern pig iron makers, or to the large orders taken by the plate mills.

It is true that in the majority of cases the sellers covered the necessary raw material at correspondingly low prices, and that, generally speaking, the transactions leave a profit. But the net returns on the contracts now being filled are not anywhere near those which outsiders may easily figure out on the basis of values current during the past two months. Of course every day which passes clears away low priced contracts and substitutes far more remunerative work. But after all this process is slower than many believe,

and the fear of a reaction with its troubles and adjustments is even now beginning to creep over the trade.

The statistics of the production of pig iron in Great Britain just published by the British Iron Trade Association produce almost a shock of surprise. It seems that there was actually a falling off in the output of 1898 as compared with 1897, the figures being 8,817,109 tons and 8,631,151 tons, respectively. Our own production was 11,773,934 tons, or more than 3,000,000 tons larger.

CORRESPONDENCE.

The Western Bar Iron Consolidation.

To the Editor: Interviews which I have had with several of the iron manufacturers who are parties to the proposed combination of rolling mills have suggested to me the idea of calling the attention of the trade to some points.

The proposed combination has been represented to the manufacturers as beneficial, because it will stop ruinous price cutting, will facilitate the filling of orders from the nearest mill to the point of delivery, and because it avoids the present expenses of selling products. It is not quite plain why the saving of this latter 50 cents per ton should make the mill owners very happy when the fact that their product has advanced somewhere from \$5 to \$8 per ton recently did not bring much happiness to them. However, while the benefits arising from the proposed plan in the selling of materials cannot be disputed, and are much to be desired, the proposed new company will be found to make a serious blunder if the plan as proposed by the promoters in buying their raw material be carried out. This is to have in each distributing center one general purchasing agent, who will have a fixed price for the various classes of scrap material, buy the same f.o.b. at that particular city and distribute it as the various mills require. By this means it is thought that prices can be kept more uniform, and such fluctuations in value as the present one, which is really of no benefit to any one, can be avoided.

From my experience in this particular line of business I can safely predict that this plan will not work at all. In the first place a representative cannot be at every little place where scrap originates. The dealers in this commodity have made it a business to obtain the benefits of through freight rates to the points of consumption, which are considerably lower than the sums of the local rates between points of production, the center of distribution and the point of consumption. Another point is that it will take several years for the local purchasing agent of the mills to know which scrap is suitable for the various mills. Not all use the same grades of scrap. The mill owners may think they do, but they really do not. The dealers have learned this through the experience of many years and at quite a cost to them, represented in freights paid on rejected cars, &c., until the dealers know by this time which mill can use the scrap from a particular shop and which cannot. The dealers will not be very willing to vouchsafe this information to the new purchasing agents. Another feature, and the most important, is that parties who have grown up and acquired a competency through being in a certain line of business for many years will not permit themselves to be handicapped by the supreme will of one party who shall fix the price at which they will have to market the goods. If it is proposed that there shall be one price to all, to the dealer who handles thousands of tons and the one who handles a single carload, to the railway company or the proprietor of a machine shop who has one car to sell, there will be a "kicking over the traces" which will make the heads of the consumers swim.

An undesirable rise in values, like, admittedly, the present one is, cannot be avoided. The present high rates of freight shut out all the mills from the Chicago market which are more than 200 miles distant from here. The mills going into the proposed combination located within that distance of Chicago which are of much importance are only five or six in number. The proprietors of these are all good personal friends, who have often been in communication as to the prices they were paying for raw material, and have never tried to outbid each other in buying scrap. Nevertheless, the present demand for all classes of iron and steel has sent the prices for scrap skyward. If the five or six consumers had been united in one company they could not have prevented this. It may not be known to the manufacturers of bar iron that they use only a certain proportion of the various classes of scrap. There are a great many consumers who bushel, puddle, pile and melt scrap who do not make bar iron for the market. These will at all times purchase scrap ma-

terial. The dealers themselves will do likewise, and the local purchasing agents will soon find that they will not dictate the prices at which they will take the scrap, but that the sellers will dictate to them the price which will buy it.

Whenever the supply of scrap has exceeded the demand the mills have been always able to dictate the terms upon which they purchased. Whenever the conditions were reversed it was the seller who did the dictating, and the forming of a combination will not alter this state of things. As the last resort the scrap sellers would possibly co-operate with the bar iron consumers in erecting new plants, which, without intending to fight the large company, may create a very undesirable competition. Various large malleable iron manufacturers in the country several years ago formed one large company with factories at several distributing points. They have followed a wise plan of letting each local factory buy its supplies as cheaply as possible, at the same time being in constant communication as to the values paid. If this wise plan is followed by the new rolling mill combination they will find it to be very satisfactory all around. Otherwise the very unsatisfactory state of things outlined above will be created.

I think that your influential journal could do much toward preventing the mill owners from making this mistake by calling their attention to its consequences. A large company carrying on the iron manufacturing business in this country can only be beneficial to all having business with it, but its lines for doing business must be on the liberal basis, and not arbitrary. Railroad freight agents fail continually in maintaining the rates they make, but they have never learned yet to appreciate the fact that the cause of the failure is in their trying to legislate on matters which they do not understand. If they would call representatives of the shippers of various commodities into their meetings they would probably learn what rates can be maintained and which cannot, as there are certain conditions which only the shippers know. Exactly the same principle applies to this matter of scrap material. The consumers know all about working it up, but are not at all posted about the business of accumulating it. The fact must not be lost sight of that the raw material for the manufacturing of iron cannot be controlled in such a way as the raw material for the recently formed tin plate, steel and wire companies, consequently different lines must be laid down for the purchasing of their supplies.

A SCRAP IRON MERCHANT.

CHICAGO, March 10, 1899.

The Condition of the Iron Trade.

To the Editor: To one familiar with the Alabama and Tennessee furnaces the present condition of affairs there is so great a change from what was the case a year ago as to practically amount to a revolution. The larger furnaces up to the beginning of the export trade saw their iron yards gradually grow until many of them measured acres in extent. There was practically an unlimited supply always on hand of all grades. Years ago conservative foundrymen were in the habit of carrying from six months to a year's supply in their yards. They gradually found, however, that they were locking up capital needlessly in this way, as they were always able to buy iron for quick shipment. So little by little a change took place in this practice, and the consumers instead of carrying stocks transferred the stocks to the furnace yards. It is only here and there to-day that a foundry can be found that still adheres to the old plan of carrying in its own yard a large amount of iron. This state of things of course is having its natural consequence.

The export trade started the reduction of furnace stocks. Great blocks of iron in furnace yards, particularly in the Birmingham district, were sent abroad. Better times came almost imperceptibly on this side of the water, the consumptive demand increased and all at once the foundrymen awoke to the fact that they had no iron on hand, that the furnaces on which they had been depending for so long had no iron on hand, and that they were in danger of not being able to get enough from their customary sources of supply to keep them going. The consequence has been that for three months now there has been a steady and continued demand such as the country has not known for many years. If the expansion in business had come with a stock of iron on hand in either the yards of the consumer or of the furnaces there would have been time for a readjustment of conditions gradually, but as it is there is vastly more business offering than the furnaces are able to handle, and it is more than likely that the scarcity of pig iron will, as the season advances, increase rather than diminish.

It is a very singular sight in the South now to see them sifting over the ground on which the furnace iron was formerly piled in order to get the scraps and odds and ends to put them back through the furnace again. It is an absolute fact to-day that every furnace in the South is shipping iron hot. It is being taken out of the

cast house, weighed and put into cars for shipment just as soon as it is cool enough to be handled with safety.

In the Birmingham district, while there is absolutely no lack of raw materials, for there is enough coal, ore and limestone to last there at the present rate of consumption for centuries, it is out of the question to think that there can be much increase in production for many months to come. Already every coke oven that can be pressed into service is running to its full capacity, every ore mine is going, and to start new furnaces would require a large capital expenditure in the direction of coal and ore mines and coke ovens. This may be made presently, but it takes more than a month or two of genuine prosperity to induce capital to go into such enterprises.

There is one thing, however, that is certain to any one who is personally acquainted with all of the conditions in the iron districts south of the Ohio River, and that is there can be no let up either in their activity or their prosperity during the current year.

MATTHEW ADDY & Co.

CINCINNATI, OHIO, March 7, 1899.

OBITUARY.

ANDREW J. HAWS.

Andrew J. Haws, who died in Philadelphia, March 9, helped to roll the first rail ever made at the Cambria Iron Works, Johnstown, Pa. Later he engaged in the manufacture of fire brick, in which he amassed a fortune.

FRED. C. WEIR.

Fred. C. Weir, president of the Weir Frog Company, Cincinnati, Ohio, died on March 1 at the Good Samaritan Hospital, Cincinnati, of heart disease, aged 64 years. Mr. Weir spent many years in Russia superintending the engineering of railroads. Twenty-five years ago he returned to the United States and embarked in the railroad frog manufacturing business, which he conducted up to the time of his death.

ROBERT B. DASHIELL.

One of the most able officers of the construction branch of the naval service, Assistant Naval Constructor Robert B. Dashiell, died on March 8, at his home in Washington, D. C., of cerebro-spinal meningitis. Mr. Dashiell, who was only 38 years old, was appointed a naval cadet from his native State, Maryland, and graduated in 1884. He was one of the brightest young officers in the naval service, and became widely known as an ordnance expert, taking charge of the Indian Head proving ground when but an ensign. As an assistant naval constructor Mr. Dashiell made a specialty of the subject of docks and came to be looked upon as an authority. He was a man of ability in many lines of work. At Indian Head he built railways, designed the buildings, and at the same time kept up the current work of the proving ground in testing armor plate, projectiles and powder. He invented a rapid fire breech mechanism which is known to ordnance experts throughout the world.

CHARLES M. MITCHELL.

Charles Moulton Mitchell, president of the Bridgeport Brass Company, Bridgeport, Conn., and of the Steele & Johnson Mfg. Company, Waterbury, Conn., died March 9, at his home in Waterbury, at the age of 77 years. Mr. Mitchell was one of the most prominent citizens of Waterbury.

WILLIAM B. MIDDLETON

William B. Middleton, general manager of the Taylor Iron & Steel Company of High Bridge, N. J., succumbed on the 8th inst. to a very severe surgical operation for intestinal trouble, with which he had been afflicted for a long time, having previously undergone a series of operations successfully. Mr. Middleton was born in Philadelphia, September 17, 1849. He began his career with the Phoenix Iron Company of Phoenixville, Pa., and was afterwards connected with the Edge Moor Iron Works of Edge Moor, near Wilmington, Del. Later he was interested in the Penn Iron Company of Lancaster, Pa., and was subsequently superintendent of the Pennsylvania Bolt & Nut Company of Lebanon, Pa., and of the Allison Mfg. Company of Philadelphia. He became general manager of the Taylor Iron & Steel Company, June 15, 1896.

JOHN H. REED.

John H. Reed, quartermaster general on the staff of Governor Andrew of Massachusetts during the Civil War and for many years one of the most public spirited and influential citizens of Boston, died on March 6, at Roxbury, Mass., from an illness resulting from exposure during the blizzard last November. He was born in Boston

71 years ago and there had a business training. For several years Mr. Reed was president and treasurer of the Bay State Iron Company, which had extensive plants in Boston and on Lake Champlain. This concern ceased to do business in 1883, and since then Mr. Reed had not been actively engaged in business.

EDWARD S. TABER.

Edward S. Taber, president and treasurer for the past 30 years of the Morse Twist Drill & Machine Company, died on March 10, at New Bedford, Mass., after a brief illness, aged 73 years. Mr. Taber was born at New Bedford and had resided there for the greater part of his life. He was for a time employed in the engine works of George H. Corliss, at Providence, R. I. He was one of the leading business men of his city, and for some years had been president of the First National Bank of New Bedford.

HENRY C. EYRE.

Henry C. Eyre, formerly a leading contractor and business man of Chester, Pa., and founder of the machine and foundry firm of H. C. Eyre & Co., died in Chester on March 13.

HIRAM KIMBALL.

Hiram Kimball, one of the best known business men of Cleveland, Ohio, died in that city on March 9, from Bright's disease, after an illness of several months, aged 54 years. He was born in Randolph, Vt., and early evinced a taste for mechanics. After a technical education in Philadelphia he was employed as engineer by Holley in the development of the Bessemer process of steel making in this country. He was also engaged at one time in the Edgar Thomson Steel Works. He was the inventor of many important devices, which brought him a fortune. Among them was a rail joint and a turnbuckle. The latter device was manufactured by the Cleveland City Forge & Iron Company, Cleveland, Ohio, under his supervision. He also formed the Chapman Jack Screw Company, of which he was the president, and the Butler Draw Bar Attachment Company, both of which concerns were affiliated with the Cleveland City Forge & Iron Company. Mr. Kimball was also interested in the city street railways of Cleveland and in several other local enterprises.

GEORGE I. HAGAR.

George Ingersoll Hagar, hardware merchant, Burlington, Vt., died suddenly of heart disease on the 25th ult. Mr. Hagar was born in Shelburne October 17, 1836. He came to Burlington with his parents when a small boy and when his father, the late Luther M. Hagar, went into the hardware business the son entered his employ. For some years the firm name was L. M. & G. I. Hagar, and in 1870 Mr. Hagar became the proprietor. Mr. Hagar was a veteran of the late war. The business will be continued by Mr. Hagar's sons.

HENRY E. SMYSER.

Henry E. Smyser, a mechanical engineer of note, died suddenly March 11 at York, Pa., where he had gone for a brief period of recreation. Mr. Smyser was born at York, Pa., 62 years ago. While the inventor of many useful mechanical devices, he was best known as the inventor of the coffee packing and sugar packing machines used by the Arbuckles of Brooklyn, N. Y., in whose service he had been as superintending engineer since the purchase of his patents seven years ago.

The World's Spelter Production.—We are indebted to the American Metal Company, Limited, for a copy of the estimate of the world's production of spelter annually prepared by Henry R. Merton & Co. of London. For the last three years the figures are in gross tons:

	1896.	1897.	1898.
Rhine, Belgium and Holland.....	188,815	184,455	179,730
Silesia.....	97,670	94,045	95,875
Great Britain.....	27,190	23,430	24,880
France and Spain.....	32,135	32,120	28,450
Austria.....	7,115	8,185	9,255
Poland.....	5,575	5,760	6,165
Total.....	358,500	347,995	344,355
United States.....	102,395	88,207	73,105
Total tons.....	460,895	436,202	417,460

The greatest increase has been in the United States.

A joint convention of coal operators and miners of Illinois, held last week in Chicago, reached a harmonious conclusion by the adoption of an agreement ratifying the Pittsburgh agreement, which places the scale of wages at substantially the same figures as those in force last year.

The Pennsylvania Railroad Company, it is announced, will build this year 123 new locomotives in their shops at Altoona, Pa.

MANUFACTURING.

Iron and Steel.

We have already noted the fact that the La Belle Iron Works, Wheeling, W. Va., purchased the property of the Jefferson Iron Works, at Steubenville, Ohio, some two weeks ago. It is not known just at present what will be done regarding operating the plant, the blast furnace being under lease to the Aetna-Standard Works of the National Steel Company until January 1, 1900. The statement that the La Belle Iron Works would add a new steel plant is untrue. No definite plans have yet been made as to what they will do with the property.

The Central Iron & Steel Company, Harrisburg, Pa., are making extensive improvements in their No. 2 mill, so that their product will be largely increased. All the plants of this concern are now turning out an average of about 2500 tons of plates per week, and this will be increased to 3000 tons. The Central Iron & Steel Company who include the Universal Mills, Paxton Mills and mill No. 2, all at Harrisburg, have posted a notice that on April 1 a readjustment and advance in wages would take place. About 600 employees are affected.

The National Steel Company have purchased the blast furnace of the Thomas Furnace Company, at Niles, Ohio. This furnace is 76 x 17. The original stack was built in 1870, was enlarged in 1883 and torn down and rebuilt in 1890, and contains entirely new equipment. It has four Massick & Crookes stoves, and the daily capacity is about 300 tons. It is stated that the National Steel Company are negotiating for the purchase of several more blast furnaces in the Mahoning Valley.

It is stated that one of the conditions in the options given by the Brown-Bonnell Iron Company, the Andrews Brothers Company and the Mahoning Valley Iron Company on their plants in Youngstown is that a sufficient amount of money shall be set aside by the consolidation to erect a large Bessemer steel plant in Youngstown. It is also stated that an option on about 65 acres of ground just outside of Youngstown has been secured, and if it is decided to build the plant it will likely be built on this property.

The Youngstown Steel Company, Youngstown, Ohio, made a shipment last week of about 300 tons of washed metal to Manchester, England. This is one of a number of similar shipments made by this concern.

The sale of the plant of the Canonsburg Iron & Steel Company, at Canonsburg, Pa., to the American Tin Plate Company has practically been concluded. Some details remain to be arranged, but these will likely be fixed up this week.

The plant of the Lewisburg Rolling Mill, at Lewisburg, Pa., which has been idle for a long time, will probably be dismantled and sold for scrap.

The Lukens Iron & Steel Company, Coatesville, Pa., have just awarded contracts for extensive improvements to their plants. The contract for an open hearth furnace building, heavy steel frame and galvanized steel corrugated roof construction, to be completed by June 1, has gone to W. W. Lindsay & Co., Philadelphia; a universal mill building of the same construction is to be built in four months by the Shiffler Bridge Company, Pittsburgh, Pa., and H. E. Smythe & Co., Pittsburgh, are to build four 50-ton open hearth furnaces, gas producers, chimneys, charging platform, &c. An order has been given to the Morgan Engineering Company, Alliance, Ohio, for a 75-ton electric ladle crane; and another to Pawling & Harnischfeger, Milwaukee, Wis., for one 20-ton, three 10-ton and one 5-ton electric traveling cranes.

The Carbon Steel Company of Pittsburgh have posted notices at their plant stating that, taking effect March 12, wages of all their employees will be advanced from 5 to 10 per cent., depending on class of labor.

An accident was recently caused at the works of the Lackawanna Iron & Steel Company, Scranton, by the breaking of a fly wheel on an engine built by the Southwark Foundry & Machine Company of Philadelphia. We learn that while the engine was built by the concern in question the fly wheel was not. It was an old wheel, used by the Lackawanna Iron & Steel Company, and its breakage does not therefore reflect in the least upon the Southwark Foundry & Machine Company.

The Burgess Iron & Steel Works of Portsmouth, whose plant was destroyed by fire in June, 1898, expect to have a part of their new plant completed and in operation about the middle of April. The entire plant is not expected to be finished and in running order before July or August. The new steel department will contain two 24-ton crucible steel furnaces, four 50-ton basic open hearth steel furnaces and two 50-ton acid open hearth steel furnaces.

Sharpsville Furnace, at Sharpsville, Pa., owned by the Sharpsville Furnace Company, blew in last week after an idleness of about one year. But two furnaces in Sharpsville are now idle, Douglass and Alice, and it is expected both of these will be blowing in a short time.

Negotiations are proceeding for the sale of the Calumet Iron & Steel Company's property at Cummings, near South Chicago, Ill. Special interest attaches to this property at present on account of the blast furnace, which was last in operation in 1895, and which is reported to be in fair condition. If the sale is

made the new owners are expected to take steps to put the furnace in operation as early as possible.

Announcement is made of an application for a license to incorporate the South Chicago Furnace Company, at Chicago, with a capital stock of \$300,000, by Thomas M. Butters, Herbert H. Hall and Wm. H. Dayton. Inquiry fails to disclose the special project which they have in view, but it is stated that Mr. Butters is one of the Butters Brothers, lumbermen, of Manistee, Mich., who bought 12 acres of land last year on the Calumet River, in a good location for operating a blast furnace.

At a recent meeting of the Puget Sound Wire Nail & Steel Company, Everett, Wash., the following officers were elected: D. A. Merriman, president and treasurer, and H. J. McManus, secretary and general manager.

At the annual stockholders' meeting of the Lackawanna Iron & Steel Company at Scranton, Pa., on March 1, the following directors were elected: Samuel Sloan, Walter Scranton, W. E. Dodge, D. C. Blair, Moses Taylor Payne, Henry Wehrum, S. S. Palmer, Austin D. Blair and Arthur Scranton.

The National Wire Company of New Haven, Conn., have been incorporated with a capital stock of \$200,000 by George R. Wales, Walter H. Seaver and William S. Pardee.

At a meeting of the newly organized Eagle Iron Company, Chattanooga, Tenn., who will operate the iron furnace at Attalla, Ala., the following officers were elected: President, L. S. Colyar; vice-president, J. H. Barr; secretary, Graham Crabtree.

While it is true that the directors of the American Steel & Wire Company have had under advisement the building of four large open hearth furnaces at Cleveland, and a like number at Worcester, Mass., no decision has been reached as yet concerning these improvements.

A report has been current that the Pennsylvania Steel Company of Steelton, Pa., were about to build six new 50-ton open hearth furnaces. As a matter of fact only two 30-ton furnaces are projected. Six new ordinary pit furnaces for heating ingots for the blooming mill are being built.

On March 10 Henry Whiteley and the Girard Trust Company of Philadelphia, receivers for the McCullough Iron Company, Wilmington, Del., were discharged by order of the United States Court. The property has been returned to the stockholders and the business will hereafter be conducted by the company in its corporate capacity. Henry Whiteley is president, H. H. Haines, vice-president, and Martin E. Walker, secretary and treasurer.

It is reported that negotiations are progressing between the Virginia Iron, Coal & Coke Company and the Watts Steel & Iron Syndicate of Middlesborough, Ky., for the purchase of the plant of the latter.

Machinery.

The plant of the Gray Iron Casting Company, at Mount Joy, Pa., has been destroyed by fire.

The Pennsylvania Pump & Supply Company of Pittsburgh have been granted a charter of incorporation with a capital of \$5000. The directors are W. E. Ross, Sharpsburg, Pa.; H. W. Sheets, Bellaire, Ohio; Ross J. Cavanagh, Pittsburgh; John R. Cavanagh, Pittsburgh, and G. S. Howland, Wilkinsburg.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh have made an arrangement with the American Tin Plate Company for the use of the F. I. Freeman apparatus for charging annealing furnaces, which is being made by the Totten & Hogg Iron & Steel Foundry Company. The use of the machine for annealing in sheet mills is not affected by the contract. The device is in use in a number of tin plate mills owned by the American Tin Plate Company.

The Pittsburgh Plate Glass Company have commenced the erection of a large foundry in their works at Ford City, Pa. The structure will be of steel and brick and will contain modern appliances throughout.

The Lavigne Automatic Mfg. Company have been incorporated in New Jersey to manufacture automatic machinery of all kinds. The capital stock is \$150,000, and the incorporators are Benjamin Eastwood of Paterson, John J. Tower of New York and William H. Cole of Jersey City.

At the annual stockholders' meeting of the New Britain Machine Company, New Britain, Conn., the following officers were elected: President, Philip Corbin; vice-president, M. C. Swift; treasurer, F. G. Platt; secretary, R. S. Brown.

Heggle Bros., Joliet, Ill., boiler manufacturers, are arranging for the early erection of a large steel construction shop, to be equipped with traveling cranes, modern tools and all the appliances for getting out increased product at lower cost.

The Link-Belt Machinery Company, Chicago, have increased their capital stock from \$250,000 to \$375,000.

The English Engine & Supply Company, formerly at Kansas City, Mo., are now operating a general jobbing foundry in the old stove property at Leeds, Iowa, a suburb of Sioux City.

The A. Garrison Foundry Company of the South Side, Pa., have given their employees a 10 per cent. advance in wages.

The Muskegon Iron & Steel Company of Muskegon, Mich., have recently placed in Pittsburgh contract for a large lot of new equipment for an addition to their works.

The plant of the Sharpsville Foundry & Machine Company,

at Sharpville, Pa., was offered at public sale last week. The highest bid was \$2900, which was refused and the sale postponed until March 15.

The steamships of the Scandinavian Line between New York and Sweden, sailing about every two weeks, are carrying much machinery built at the shops of the Pusey & Jones Company of Wilmington, Del., for Sweden. Several carloads of paper machinery were shipped recently, and the steamers sailing for some time will also carry products from their works, as they are supplying the machinery for a large paper mill just completed in that country.

The Powell Planer Company of Worcester, Mass., made the first shipment a fortnight ago of a large planer which they have just finished for De Fries & Co. of Dusseldorf, Germany. Six cars went out from the works, and it will take one or two more to complete the shipment of the entire machine, which will be carried across the water by the Hamburg-American Line. The planer will plane 129 inches in width and 37 feet in length between the pockets of the table, and it is the largest planer ever built in Worcester.

The Max F. Abbé Mfg. Company, 26 Cortlandt street, New York, designers and builders of special machinery, have succeeded to the business heretofore conducted by Max F. Abbé, at the same address.

The Titusville Iron Company, Titusville, Pa., intend to erect an addition to their Franklin street plant which will greatly increase the capacity of their works. The new building will be 80 x 282 feet in size and will be constructed of brick and structural shapes, and will be used as a foundry and addition to the machine shop. It is expected to be completed about September 1.

At the recent annual stockholders' meeting of the Union Iron Works, Bangor, Maine, the following officers were elected for the ensuing year: President and treasurer, Charles V. Lord; clerk, L. C. Tyler; directors, W. S. Whitman, C. V. Lord, H. P. Oliver, C. A. Gibson, L. C. Tyler, C. S. Hunt and E. M. Hersey.

The Danielson Machine & Tool Company, Cleveland, Ohio, have been incorporated, with capital stock of \$50,000, by Gustave F. Danielson, Gustave A. Kaercher, Joseph Rauff, Minard A. Possons and Charles F. Lang.

The Cincinnati Planer Company of Cincinnati, Ohio, have been incorporated with a capital of \$30,000 for the manufacture of iron and brass working machinery. The incorporators are W. H. Burtner, R. A. Holden, Jr., W. H. Burtner, Jr., George A. Armstrong, Jr., and others, all of Cincinnati.

The Diamond Bolt & Screw Company, Cleveland, Ohio, have been incorporated with a capital of \$25,000, by Isaac Lewis, Robert Lindmueller, D. E. Wright, S. C. Payne, J. W. Stoddard, all of Cleveland.

The Whitney Automatic Pump Company of Detroit, Mich., capitalized at \$300,000, have filed articles of incorporation with the Secretary of that State.

The iron foundry of John J. Bowes & Brother, West Twenty-ninth street, New York City, was almost destroyed by fire last week, the damage being estimated at \$40,000, covered by insurance.

A large refrigerating plant and warehouse are to be erected by the Rogerson Fruit & Cold Storage Company at Le Roy, N. Y. The work will be commenced as early as practicable, so as to be ready for use next fall.

Bridges.

City Engineer Jackson of Boston has the following bids for building two retractile draws for the bridge on Summer street extension across Fort Point Channel: A. & P. Roberts Company, Philadelphia, \$23,999; Berlin Bridge Company, \$23,820; Penn Bridge Company, \$25,864; Edge Moor Bridge Works, \$24,502; New Jersey Steel & Iron Company, \$24,600; Pittsburgh Bridge Company, \$24,515; Massillon Bridge Company, \$26,546; Boston Bridge Works, \$27,600; Youngstown Bridge Company, \$28,000; New England Structural Company, \$26,640; Canton Bridge Company, \$26,000; New Columbus Bridge Company, \$28,960; King Bridge Company, \$24,982.

It is conceded that the Marietta, Ohio, bridge is unsafe, and the question of a new bridge, to cost about \$25,000, will soon be put to vote.

The plans for the Maiden Lane Bridge to be built by the Central-Hudson Railroad Company at Albany, N. Y., are ready and the Hilton Bridge Company are figuring on them. The plans are in the hands of C. E. Bucholz.

The citizens of Pacific and Valley Park, Mo., have organized an association to build a bridge crossing the Merrimac River between Eureka and Crescent. The association will be incorporated with a capital stock of \$50,000.

The Central Trust Company of New York have made application for a receiver of the Duluth-Superior Bridge Company, at Duluth, Minn.

The Berlin Iron Bridge Company have a contract to build a steel bridge for the Providence division of the New York, New Haven & Hartford Railroad.

The city engineer of Toledo, Ohio, has been directed by the

Bridge Committee to submit plans for the construction of a new bridge at Lafayette street without advertising for bids.

The Railroad Commissioners at Boston are entertaining a petition of the Fitchburg Railroad Company for permission to make alterations on the highway bridges over the tracks in Somerville so as to permit the laying of four tracks. A. S. Cheever is the chief engineer of the road.

The Denver, Col., Board of Public Works will open on March 14 bids for the construction of the Stout Street Bridge. Contract for the entire work, including approaches, will be let to one man or company.

The St. Louis, Peoria & Northern Railroad is to build a steel bridge over the Illinois River a mile and a half below Peoria, but the matter before being definitely settled must go before the Secretary of War.

The Edge Moor Bridge Works have the contract for the building of 12 steel bridges on the Ogdensburg, Lake Champlain, Rutland Canadian & Rutland Railroad, aggregating in round figures \$1,000,000. Among the bidders were the Rochester Bridge & Iron Works, New Jersey Steel & Iron Works, Elmira Bridge Company, King Bridge Company, and Berlin Bridge Works.

It now looks as if there would be a \$75,000 bascule bridge across the Chicago River at Canal street, Chicago. The city and sanitary districts are expected to divide the cost.

Hardware.

The directors of the New Castle Shovel Company, recently organized at New Castle, Pa., have elected David Wallace president, David Jameson treasurer and F. E. Davis secretary. The foundations for the new building of the company are almost completed, and they expect to be in the market in three months as producers of shovels of all kinds.

William H. Haskell Mfg. Company, Pawtucket, R. I., are very busy and are running three nights each week.

Curtis & Curtis, Bridgeport, Conn., are running their entire works 13 hours a day, and have now nearly completed a large addition, which will materially increase their facilities. Their export trade has developed a good deal during the past year, until now, they advise us, quite a large percentage of their output goes to foreign countries.

Holroyd & Co., Waterford, N. Y., manufacturers of stocks and dies, are running their factory night and day in an effort to fill the numerous orders on their books.

The Peters Cartridge Company, Cincinnati, Ohio, report a good demand for their cartridges, and are circulating testimonials from shooters in regard to their merit.

Dille & McGuire Mfg. Company, Richmond, Ind., manufacturers of the Star, Diamond and other lawn mowers, and also hardware specialties, report the demand for their products as beyond that of any previous season. An addition to their plant of 25 x 50 feet has just been completed, in which the higher grades of lawn mowers only will be produced.

The Challenge Cutlery Corporation, Bridgeport, Conn., have bought out complete the Hatch Mfg. Company, Bridgeport, Conn., who are manufacturers of pocket knives, the intention being to operate the Challenge Razor Works and the Hatch pocket knife plant under one management. The fact that the two factories are adjoining properties makes this arrangement especially convenient. The officers are W. M. Taussig, president, who is likewise president of Wiebusch & Hilger, New York, and Clemens Kloeckorn, secretary and treasurer, who will also be manager of the new interest.

Miscellaneous.

Robt. Morrison, St. Louis, manufacturer of self lubricating packing, reports orders as far in excess of the usual receipts for this season. Inquiry is active and with every indication for a busy year.

The Morden Frog & Crossing Works, The Rookery, Chicago, under the energetic management of Irving T. Hartz, vice-president, have recently greatly improved their plant at South Chicago. The machinery has been largely replaced by modern apparatus within the past six months, while additional facilities are now being supplied to keep up with the demand for railroad supplies of the kind they manufacture.

The Johnston Harvester Company, Batavia, N. Y., recently shipped 21 carloads of harvesting machinery to New York to be forwarded to Russia and France.

The Continental Coke Company of Uniontown, Pa., have been granted a charter of incorporation, with a capital of \$50,000. The incorporators are Henry Wick and Wm. H. Baldwin of Youngstown, Ohio; Geo. D. Howell, Josiah V. Thompson and Frank P. Rush of Uniontown, Pa. It will be remembered that Henry Wick and Wm. H. Baldwin, representing the National Steel Company, recently bought about 1200 acres of coal lands in the Connellsville region, and it is the intention of the National Steel Company to erect coke ovens and make their own coke.

The plant of the Charles Scott Spring Company, manufacturers of car springs, Philadelphia, Pa., was destroyed by fire on Monday afternoon. The loss, which is estimated at \$90,000, is fully covered by insurance.

The Iron and Metal Trades.

In all the leading distributing centers the Iron and Steel markets are excited, and advances are being made with bewildering rapidity. The demand keeps up surprisingly well, and for prompt and early delivery it is not a question of price but simply a matter of obtaining the material. Still, indications are cropping up that the pace is too fast, and instances have come to our notice repeatedly of late of work which is being delayed or postponed because prices are regarded too high. Such cases are isolated still and do not cut any figure when compared with the urgency of the demand from many quarters.

A further sharp advance has been made in Pig Iron all along the line, including Foundry Iron, Bessemer Pig, Forge Iron and special grades. In the Central West some large blocks of Bessemer Pig may be offered by the Association at an early date. In the East there have been large sales of Low Phosphorus Iron and of Basic Pig.

Steel has rushed up squarely to \$25.50 to \$26 in the East and close to the same figure in the Central West, but the transactions are not of great magnitude.

Prices on Finished Material have been sharply advanced. Sheets, Bars, Pipe, Structural Material, Wire and Wire Nails are all higher, and yet the market is kept clear. The fact is that large orders keep cropping up for product of all kinds. In one day a tidewater shipyard had inquiries for 11 large steamers and could not accept a single one.

Occasionally facts come to the surface which seem to invalidate the conclusion that we are cutting off our export trade completely. Among these we may note the sale of about 3500 tons of Merchant Pipe by the National Tube Works to South Africa, or the contract taken by the Pennsylvania Steel Company for the great Grogtyek viaduct in Burmah, which is to be over 300 feet high and will call for about 3000 tons of material.

As against this we note that this week an order for about 8000 tons of Cast Iron Pipe for Buenos Ayres was lost by the American bidders, an English concern taking the order at 12 cents per ton less than the American bid.

In consolidation matters little that is new has cropped up. It is understood that the option to take the Ore of the Oliver interest on a sliding scale arrangement continues open to the National Steel Company until the return of H. W. Oliver from the Antilles. The National Steel Company have acquired the Thomas Furnace at Niles and are negotiating for other furnaces.

It looks as though the close relations necessary between the tin plate interest and the sheet mills would be established. Options on the plants are now being obtained and an organization may be perfected in a few weeks.

The reports of the sale of the Ashland plant to the American Steel & Wire Company are decidedly premature, to put it mildly.

It is understood that an option has been obtained on the splendid plant of the Riverside works of Wheeling by those who are working on the Pipe consolidation.

The organization of the Cast Iron Pipe consolidation is to be effected this week.

A Comparison of Prices

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type.
Declines in Italics.

	Feb. 15, 1899.	Feb. 8, 1899.	Feb. 15, 1899.	Feb. 15, 1898.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$14.75	\$13.75	\$12.25	\$10.50
Foundry Pig, No. 2, Southern, Cincinnati.....	14.00	13.25	12.00	9.00
Foundry Pig, No. 2, Local, Chicago.....	14.50	14.00	12.50	10.75
Bessemer Pig, Pittsburgh.....	15.65	13.50	11.50	10.35
Gray Forge, Pittsburgh.....	13.50	12.75	11.25	9.25
Lake Superior Charcoal, Chicago.....	15.00	14.50	12.50	11.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh.....	25.50	23.50	18.00	15.25
Steel Billets, Philadelphia.....	26.00	25.50	20.50	17.50
Steel Billets, Chicago.....	24.00	23.50	20.00	17.50
Wire Rods, Pittsburgh.....	31.00	.....	.....	22.00
Steel Rails, Heavy, Eastern Mill.....	26.00	23.00	20.00	17.50
Spikes, Tidewater.....	1.65	1.55	1.40	1.50
Splice Bars, Tidewater.....	1.30	1.20	1.15	1.15
OLD MATERIAL:				
O. Steel Rails, Chicago.....	9.50	9.50	8.00	8.50
O. Steel Rails, Philadelphia.....	14.00	13.25	.....	10.50
O. Iron Rails, Chicago.....	16.00	16.00	14.00	12.25
O. Iron Rails, Philadelphia.....	17.00	16.00	13.75	12.50
O. Car Wheels, Chicago.....	15.00	15.00	13.00	11.50
O. Car Wheels, Philadelphia.....	14.50	13.50	11.00	10.25
Heavy Steel Scrap, Chicago.....	9.50	9.50	8.00	7.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia.....	1.50	1.30	1.20	1.05
Common Iron Bars, Youngstown.....	1.35	1.20	1.05	0.90
Steel Bars, Tidewater.....	1.45	1.35	1.20	1.10
Steel Bars, Pittsburgh.....	1.35	1.25	1.10	0.92 1/2
Tank Plates, Tidewater.....	1.90	1.85	1.60	1.05
Tank Plates, Pittsburgh.....	1.75	1.60	1.50	0.97 1/2
Beams, Tidewater.....	1.55	1.55	1.45	1.30
Beams, Pittsburgh.....	1.40	1.40	1.30	1.15
Angles, Tidewater.....	1.45	1.40	1.35	1.15
Angles, Pittsburgh.....	1.35	1.30	1.20	1.00
Skelp, Grooved Iron, Pittsburgh.....	1.40	1.40	1.25	1.05
Skelp, Sheared Iron, Pittsburgh.....	1.50	1.50	1.35	1.10
Sheets, No. 27, Chicago.....	2.45	2.30	2.20	2.05
Sheets, No. 27, Pittsburgh.....	2.35	.....	2.05	1.90
Barb Wire, f.o.b. Pittsburgh.....	2.50	2.35	2.10	1.70
Wire Nails, f.o.b. Pittsburgh.....	2.00	1.85	1.60	1.40
Cut Nails, Mill.....	1.50	1.40	1.35	1.10
METALS:				
Copper, New York.....	17.75	17.75	18.00	12.00
Spelter, St. Louis.....	6.00	5.80	6.00	4.00
Lead, New York.....	4.45	4.30	4.50	3.70
Lead, St. Louis.....	4.25	4.15	4.30	3.02 1/2
Tin, New York.....	23.80	23.85	27.75	14.25
Antimony, Hallett, New York.....	10.00	10.00	9.75	7.50
Nickel, New York.....	38.00	38.00	38.00	33.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York.....	4.10	.....	3.44	2.90

Chicago. (By Telegraph.)

Office of The Iron Age, 805 Fisher Building, }
CHICAGO, March 15, 1899. }

The pressure continues for all classes of material with no signs of diminishing. Prices are still advancing and in many cases the most important question is that of delivery, as any reasonable advance will be paid for prompt shipment. Many consumers have evidently been caught short because they had no faith in a permanent improvement of the market, and others found that they had failed to make contracts large enough to cover their full requirements. The week has been fairly active, and all its developments have served to make people more confident of still higher prices. The several new consolidations are reported to be working along satisfactorily toward a successful conclusion. The Western Bar mills are reported to have all given options to the promoters and the deal is expected to be closed within a week or two. The Sheet mill consolidation is also stated to be rapidly getting into the same shape. The American Car & Foundry Company have bought the Indiana Car & Foundry Company, Indianapolis, for about \$120,000.

Pig Iron.—The situation is as strong as ever. A much larger quantity of Iron could be sold if the producers were willing to take the business now being offered, but buyers are either discouraged by higher quotations or by positive refusals to quote. Sales agents are disposed to think the conditions are somewhat artificial, as consumers are now trying to buy who should not be in the market until June or July and are endeavoring to place contracts for deliveries running into next year. The local furnaces have been more disposed to check business than Southern sales agents. The latter report quite large contracts for delivery during the last half of the year. They are doing this more freely since prices have been advanced to a level which now makes such business attractive. Prices are higher all along the line, and our quotations are marked up from 50c. to \$1 per ton. Some sales have been made at extreme prices, as for instance a small lot of No. 2 Southern Foundry was sold at \$16.25 for immediate delivery. But this is not regarded as a fair test of market conditions. Ferromanganese has advanced \$5 for 80 per cent. The scarcity of Pig Iron in this locality is causing the idle fur-

naces to be put under lease, and the probabilities now are that within a month or two at least two additional stacks will be in operation. The Southern furnace companies are now shortening their terms and insist on spot cash instead of giving 30 days. We quote for cash as follows:

Lake Superior Charcoal.....	\$15.00 to \$16.00
Local Coke Foundry, No. 1.....	15.00 to 15.50
Local Coke Foundry, No. 2.....	14.50 to 15.00
Local Coke Foundry, No. 3.....	14.00 to 14.50
Local Scotch, No. 1.....	15.00 to 15.50
Ohio Strong Softeners, No. 1.....	15.50 to 16.00
Southern Silvery.....	15.50 to 16.00
Southern Coke, No. 1.....	15.00 to 15.50
Southern Coke, No. 2.....	14.50 to 15.00
Southern Coke, No. 3.....	14.00 to 14.50
Southern Coke, No. 1 Soft.....	15.00 to 15.50
Southern Coke, No. 2 Soft.....	14.50 to 15.00
Foundry Forge.....	14.00 to 14.50
Gray Forge and Mottled.....	14.00 to 14.50
Southern Charcoal Softeners.....	15.00 to 15.50
Alabama and Georgia Car Wheel.....	17.50 to 18.00
Malleable Bessemer.....	to 15.00
Standard Bessemer.....	to 15.00
Spiegel, 20 per cent.....	to 30.00
Jackson County Silvery, according to Sil- con.....	15.50 to 16.00

Bars.—A great deal of inquiry is reported by manufacturers, with rather free buying. Good orders have been placed by car builders for Bar Iron, including lots of 2000 tons. Excellent contracts have been entered into for Soft Steel Bars, among them being one for 7000 tons. Prices vary considerably according to deliveries and quantities. A good round lot of Soft Steel Bars was sold by a Pittsburgh mill at 1.60c., Chicago. Youngstown mills are now quoting 1.50c. at mill, equal to 1.63c., Chicago, on each Iron or Soft Steel Bars. Mills in this vicinity are not quite so high and quote mill shipments at 1.40c. to 1.50c., Chicago, for Common Iron. No sellers of Steel Bars can be found below 1.56c., Chicago, and that price is made only for immediate acceptance. Hoops are quoted at 1.65c., base, Chicago, for Bands, with full extras. A very large business is being done by jobbers, who quote small lots of Bar Iron at 1.65c. upward, full extras, and 1.70c. to 1.75c. for Soft Steel Bars, but on Steel all houses have not yet advanced to this rate. Norway and Swedish Iron is held at 3.20c. to 3.25c.

Car Material.—More car orders are in the market, and the outlook in this direction continues extremely good for much further business, which is decidedly encouraging to the Iron trade.

Structural Material.—Quite a heavy tonnage has again been placed in lots of 1000 to 3000 tons, mainly for bridges, but several buildings have been placed under contract in outside cities, in no case taking very large quantities. Angles have been advanced another \$1 per ton. Mill shipments are quoted as follows, Chicago delivery: Beams and Channels, up to 15 inches, 1.55c. to 1.60c.; 18 to 24 inches, 1.65c. to 1.70c.; Angles, 1.50c. to 1.55c.; Universal Plates, 2c. to 2.10c.; Tees, 1.60c. to 1.70c. Small lots from store are selling at 2c. upward for Beams and Channels, 15-inch and less; 1.60c. to 1.65c. for Angles, and 1.70c. to 1.75c. for Tees.

Plates.—The strong demand continues. The local mills, sales agents for outside mills and jobbers are all doing a very good business. Jobbers, however, state that their tonnage is not heavier than usual at this season. Local mills have sold about 7000 tons for delivery the last half of the year. The earliest shipment they can now promise is in August. Some high prices have been heard on small lots of Plates for early shipment. The jobbers quote 2c. on Tank Steel from stock, but mills report that they have sold the same material as high as 2.15c. to 2.20c. for delivery during the next 90 days. Mill shipments for such deliveries as can be made are quoted as follows, Chicago delivery: Tank Steel, 1.80c.; Flange, 1.90c.; Marine, 2.20c.; Common Fire Box, 2.75c.; Best Fire Box, 3¼c. to 4¼c.

Merchant Pipe.—The demand continues excellent despite the advance. Jobbers are having a very good trade, the higher prices apparently stimulating business. A further advance of 10 per cent. was made on Monday of this week, and mill shipments are now 60 and five 10's on the full list of Pipe. Merchant Boiler Tubes are quoted in small lots, 1¼ to 1½ inch inclusive, 45 per cent. off for Iron and 50 per cent. off for Steel; 2 to 2¼ inch inclusive, 57½ per cent. off for Iron and 62½ per cent. off for Steel; 3-inch and larger, 65 per cent. off for Iron and 67½ per cent. off for Steel, with an extra 5 per cent. for carload lots.

Sheets.—A brisk demand is reported for Black and Galvanized Sheets, but serious difficulty is found in securing a mill able to take business. A large buyer last week sent inquiries to all the Sheet mills known to him and received only one quotation. Sales have been made at 2.45c. to 2.50c., Chicago, for mill shipment of No. 27 Black, but some mills are reported to be asking

as high as 2.68c. Galvanized Sheets are firmly held at 75 per cent. off, with 15c. freight allowance. Jobbers have advanced the price of Galvanized to 70 and 10 per cent. off, but continue to quote No. 27 Black at 2.70c. and Wood's Smooth at \$3, base.

Merchant Steel.—Business keeps up steadily notwithstanding the advanced prices. Quotations are again marked up this week. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2.30c. to 2.40c.; Smooth Finished Tire, 2.10c. to 2.20c.; Open Hearth Spring Steel, 2.30c. to 2.40c., base; Toe Calk, 2.30c. to 2.40c., base; Ordinary Tool Steel, 5.50c. to 7c.; Specials, 10c. upward. Jobbers are quoting small lots from stock at 2.60c. for Tire, 2.80c. for Machinery, 2.80c. for Spring, and 2.80c. for Toe Calk, full extras.

Billets and Rods.—Ordinary Bessemer Billets are firm at \$24 for delivery at convenience of the makers during the summer months. Open Hearth Billets are quoted at \$26, but 6 x 6 inch specification Billets for forging have been sold at 2c. per pound. Wire Rods are nominally quoted at \$30, but the makers have none for sale.

Rails and Track Supplies.—Negotiations are proceeding for a considerable tonnage of Heavy Section Rails which may be closed this week. Quotations are held firmly at \$23 to \$25, according to quantity. Quite a tonnage of Light Rails has been sold at \$22 to \$24, according to section, but none for immediate delivery, the mills being sold up for 60 days. Track Supplies are quoted as follows: Splice Bars, 1.50c. to 1.60c.; Spikes, 1.75c. to 1.80c.; Track Bolts, with Hexagon Nuts, 2.40c. to 2.50c.; Square Nuts, 2.20c. to 2.25c.; Steel Links and Pins, 1.80c. to 1.85c.; Iron Links and Pins, 1.80c. to 1.85c.

Old Material.—Some dealers report the market inclined to be quiet, but others have been favored with excellent business, having found customers desirous of taking in considerable stock. Large sales have been made of old Car Wheels, but mainly for delivery at other points. Cast Scrap is scarce and considerably higher in sympathy with dearer Pig Iron. Dealers' selling quotations are nominally as follows, per gross ton: Old Iron Rails, \$16 to \$16.50; Old Steel Rails, mixed lengths, \$9.50; selected long lengths, \$10 to \$11; Relaying Rails, \$14 to \$15; Old Car Wheels, \$15; Heavy Melting Steel Scrap, \$9.50; Mixed Steel, \$7.50. The following selling prices are per net ton: No. 1 Railroad Wrought, \$13 to \$13.50; Dealers' Forge, \$11.50; Fish Plates, \$14 to \$14.25; No. 1 Mill, \$8.75; Heavy Cast, \$12; Stove Plates, \$7.50 to \$8; Iron Car Axles, \$16.50; Horseshoes, \$11 to \$11.50; Cast Borings, \$5.75; Steel Axle Turnings, \$8; Iron Axle Turnings, \$8.50; Machine Shop Turnings, \$7.50 to \$7.75.

Metals.—Copper is somewhat easier and carload lots of Lake are now quoted at 18c. and Western at 17½c. Spelter is not so strong as it was, carloads being now quoted at 6c. to 6.10c. Pig Lead improved during the week under a stronger demand and sales were made up to 4.25c. Sellers now ask 4.27½c. The approaching consolidation of the smelting interests has had considerable to do with imparting a better tone to the market.

Tin Plate.—Although manufacturers are not making open quotations it is stated that prices have been advanced 50c. per box on such business as is now being done. Nothing can be purchased at less than \$4 at mill for 100-pound Cokes, while jobbers quote them at \$4.60 to \$4.85 from stock. Ternes are bringing \$9.50 to \$10.50 in small lots, and 100-pound Charcoal Brights, \$6.50 to \$6.75, with \$1.50 for crosses. The demand from jobbers has been running quite heavy during the week, with a great deal of business coming from consuming manufacturers who need to replenish their stocks.

St. Louis. (By Telegraph.)

Office of The Iron Age, 512 Commercial Building, }
St. Louis, March 15, 1899. }

Pig Iron.—Foundrymen are unceasing with their plea for Pig Iron, but no relief is in sight. Inquiry indicates that no Pig Iron can reasonably be had for nearby shipments. The visible supply is constantly decreasing and foundries are more active in the search for Machinery Scrap. Agents' hands are practically empty and deliveries six and eight months hence are talked about to possible customers. A continued disposition to stave off long time engagements is manifested. Prices are on the increase, and nominally we quote, f.o.b. cars St. Louis, as follows:

Southern, No. 1 Foundry.....	to \$14.50
Southern, No. 2 Foundry.....	to 14.00
Southern, No. 3 Foundry.....	to 13.50
No. 1 Soft.....	to 14.50
No. 2 Soft.....	to 14.00
Gray Forge.....	to 13.00
Mottled.....	to 12.75

Bar Iron.—While prices show no change the disposition of consumers does. Their eagerness to place orders is being daily intensified. An increased proportion of telegraph messages furnishes an eloquent sign of the times, and it must be said for mills that they are prompt in replying. Quotations are made strictly on prompt acceptance, and no hesitancy is shown in turning down a belated order. The conditions now presented are not a matter of fancy, but entirely tangible and brought about by actual consumption. Higher prices are bound to come shortly, but at present Iron Bars are quotable at 1.30c. in mill car lots and half extras, St. Louis. Jobbers quote 1.40c. to 1.50c., full extras, from stock.

Rails and Track Supplies.—An improved demand is noted for Rails of both light and heavy sections. New wants are being brought out and considerable extensions will doubtless be made into virgin timber in view of the increased prices of lumber. We are advised that specifications for 2000 cars are being bid on for use of a prominent railway company. Higher prices are in line for Track Supplies, and we quote Splice Bars, 1.40c.; Track Bolts, with Square Nuts, 2.10c.; with Hexagon Nuts, 2.30c.; Iron and Steel Links and Pins, 1.80c.; Spikes, 1.80c.

Sheets.—Would-be buyers are more in evidence than holders of Sheets. The scarcity is brought to the attention of consumers as in all other Iron lines. The quotation of No. 27 Common Black is nominally 2.45c., East St. Louis, with higher prices probable. Galvanized is in better demand for future wants, but mills seem to be practically out of it. Discount is placed at 70 and 5 by mills.

Pig Lead.—Four and one-quarter cents was bid for Chemical Lead. No sales, however, were recorded, either for that grade or common. There is evidence of a buying movement before the week is out and at increased figures.

Spelter.—The market shows more activity, and a sale of 50 tons at 6c. is reported. Smelters have been backward about offering Spelter, but a liberal feeling seems to prevail to-day.

Albert Waycott & Co., St. Louis, have been compelled to move to more commodious quarters at Washington avenue and Second street. Their business as Railway Supply dealers is assuming satisfactory proportions, and correspondence promises numerous extensions and improvements of railways in the near future.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, {
PITTSBURGH, March 15, 1899. }

(By Telegraph.)

Pig Iron.—Last Thursday the Valley furnaces sold about 15,000 tons of Bessemer Pig at \$13.50, Valley furnace, the Iron coming to Pittsburgh. After this sale the furnaces withdrew their price and have not sold any more Iron. The day after Bessemer Pig sold at \$15, Valley furnace, and \$15.65, Pittsburgh. The Price Committee met in Cleveland on Monday to fix the price of Pig for the last half of the year, but did not come to an agreement and are to meet again on Thursday, March 16. There is a good deal of dissension among Bessemer furnaces over prices on Iron for last half, some of the furnaces refusing to sell at less than \$15 or more, while others think that price too high. It is reported that a leading consumer has offered \$15, Valley furnace, for 50,000 tons of Bessemer Pig for the last half of the year, but this is not confirmed. The Valley furnaces will probably offer a large block of Iron for the second half within a few days. Gray Forge is in good demand and has sold at \$12.85, Valley; No. 2 Foundry has sold at \$15, Pittsburgh. We quote No. 2 Foundry at \$15 to \$15.25; Gray Forge, \$13.50; Bessemer, \$15.65, all f.o.b. Pittsburgh. We note several sales of probably 5000 tons of Bessemer at \$15, Valley furnace, also two sales of 1000 tons of Gray Forge at \$13.50, Pittsburgh. Also a sale of 200 tons of No. 2 Foundry at \$15, Pittsburgh.

Steel.—Billets for spot shipment have sold at \$25, maker's mill, and a sale of 2000 tons for April and May is reported at \$25.50, makers' mill. There is not much inquiry for Steel, and in fact there is practically none to be had. Mills cannot make deliveries on Steel they have already sold, and it is foolish to take on more business.

There are only two sellers of Steel in the Pittsburgh district, these being Carnegie Steel Company and Jones & Laughlins, and both these concerns are practically out of the market, being sold up for a long time ahead.

Sheet Bars.—In view of the negotiations now under way looking to the consolidation of the Sheet mills into one company, it is believed that it will be the policy of the National Steel Company not to sell Sheet Bars for the second half to keep the Sheet mills from selling Sheets for that delivery. The new Sheet company will have a surplus of Sheets to sell at the high prices which will be in force when the Sheet mills are consolidated some time before July 1. There are no Sheet Bars being sold and there is no price.

Muck Bar.—There is some inquiry and we can note a sale of 1000 tons of best grades at \$23.25 and another sale of 1000 tons at \$23.50, delivered Pittsburgh. The market is all of \$23.50.

(By Mail.)

The Iron market is wild and excited, and prices are going skyward in leaps and bounds. All attempts to hold prices down are without avail, and everything in Iron and Steel, beginning with Coke and Pig Iron right up through the list, is advancing rapidly. The market is fully as excited as it was at any time during the boom of 1895 and prices to day are as high as in that memorable period. Since our last report Bessemer Pig has advanced fully \$1.50 a ton and has sold at \$15, Valley furnace, for April and May delivery. Billets for spot delivery have sold at \$25, maker's mill, Plates are up \$1 to \$2 a ton, Structural Material, with the exception of Beams and Channels, \$1 a ton. The minimum price of Steel Bars is 1.45c., Sheets are \$2 a ton higher, Pipe has gone up 10 per cent., Skelp is a couple of dollars higher, Wire and Wire Nails are up \$3 a ton and Rods are reported to have sold at \$32 a ton. No one can tell where prices are going to stop and alarm is being felt. We do not believe there has been much business placed for third or fourth quarters of the year, simply because no one can tell what the price of Bessemer Pig or Steel will be for the last six months. There is some dissension among the furnaces, and at a meeting held Monday in Cleveland it was found impossible to agree on a price on Pig for second half of the year. Some of the furnaces that are sold up for four to six months are trying to keep the price down, while other furnaces that have some Iron to spare want to make a heavy advance. It is pretty generally believed that at a meeting to be held in Cleveland on Thursday the price of Pig will be put at \$15, Valley furnace, for second half of the year. In answer to a report that a leading local interest and one other consumer had secured all the surplus Pig Iron that the Valley furnaces could make in the last half of the year, we can state that the report is untrue. The furnaces could not afford nor would they put their output under contract in this way. Prices are advancing so fast that it is almost impossible to keep track of them, but it is safe to say that still higher prices are certain. The necessity of the buyer is an important factor in the situation, and if he must have material for prompt shipment he is compelled to pay whatever the seller sees fit to ask. The National Steel Company have bought the Thomas Furnace at Niles, Ohio, and will take possession of it at about the opening of navigation. They are also reported to be after Struthers Furnace at Struthers, operated by W. C. Runyon. The American Steel & Wire Company are understood to be negotiating for the purchase of the plants of the Ashland Steel Company, Norton Iron Works at Ashland, Ky., and Belfont Iron Works Company, Kelly Nail & Iron Company and Sarah Furnace at Ironton, Ohio. Summed up in a few words, the present condition of the Iron trade is that it is practically impossible to get material for delivery this side of July, and a mill that has anything to sell can demand whatever price it sees fit to ask. The leading local mill is sold up on everything to July and is turning business down every day.

Ferromanganese.—Small lots of Ferro for prompt shipment are reported to have sold at \$65, maker's mill. The Carnegie Steel Company have retired from the market as sellers of Ferro, needing all their furnace capacity for their own use. They will make only enough Ferro to supply their own needs and to fill what contracts they have on their books.

Plates.—Prices on Plates for prompt delivery are very close to 2c. a pound. Some small orders for delivery within 30 days have been entered since our last report on the basis of 1.75c. at mill for Tank, and where immediate delivery is wanted from \$2 to \$3 a ton higher can be had without any trouble. None of the Plate mills have any material of any consequence to spare this side of July. When the new Plate mills now under erection are completed the Carnegie Steel Company will have a monthly

capacity of fully 30,000 tons of Plates. We quote as follows: Tank, $\frac{1}{4}$ -inch and heavier, 1.75c. to 1.90c.; Flange, 2c. to 2.10c.; Marine, 2.15c. to 2.25c.; Ordinary Fire Box, 2.50c.; Locomotive Fire Box, 3.25c. to 3.50c. Where a mill can guarantee prompt delivery of Plates higher prices than we quote might be had.

Structural Material.—The Carnegie Steel Company have advanced prices on all kinds of Structural Material, with the exception of Beams and Channels, \$1 a ton. There has been no concerted action among the Beam mills in the combination to advance prices, but it is not unlikely they will get together within the next few days and put the price up. There is a good demand for all kinds of Structural Material and the mills are full of work. Local jobs in the market are the new Dupuy Building and the Lake Erie Depot on the South Side. Some big jobs both East and West are up and are being figured on. A good deal of bridge work is also in sight. We have advanced prices on everything, except Beams and Channels, and we now quote: Beams and Channels, 15-inch and under, 1.40c.; 18, 20 and 24 inch, 1.50c.; Tees, 1.50c.; Angles, 1.35c.; Zees, 1.45c., f.o.b. Pittsburgh.

Bars.—There has been a heavy advance in prices on both Iron and Steel Bars, and the mills are so filled up with tonnage that prompt deliveries are almost impossible to get. One of the leading local mills is out of the market, being sold up to July or longer, and another large mill has practically all the tonnage on its books it can take care of for the next three or four months. The Valley mills are filled up and turning down a good deal of tonnage, unable to make deliveries. Consumers of both Iron and Steel Bars are placing larger orders than usual, and still higher prices are certain. We quote Steel Bars at 1.45c. to 1.50c. and Iron Bars at 1.35c. to 1.40c. at mill.

Spelter.—The market is again advancing and prime Western Spelter is quoted here to-day at 6.15c. to 6.20c.

Sheets.—Prices on both Black and Galvanized Sheets have again advanced. Inquiries for Black Sheet are heavy, one consumer being in the market for close to 5000 tons. Some of the Sheet mills have their entire output under contract up to July 1 and are not quoting. Other mills that have a few Sheets to spare are quoting about on the basis of 2.35c. for No. 27 and 2.40c. for No. 28. So far as we can learn none of the Sheet mills are entering orders for Sheets for delivery in second half of the year, owing to the fact that they do not know what Sheet Bars will cost and what the policy of the National Steel Company will be in this direction. Buyers, however, believe that prices will not be any lower in second half, and are taking on all the stuff they can this side of July. In Galvanized Sheets we can report a heavy inquiry, and most of the leading mills sold up for the next three or four months. The minimum price of Galvanized Sheets in large lots is 75 off, with 15c. freight allowance, and for small lots higher prices are quoted.

Rails.—There is nothing new. We quote Standard Sections at \$22, Pittsburgh; Light Sections, 25 to 40 lbs., \$22 to \$24, depending on the order and deliveries required; 16 to 20 lb. Rails, \$25, all f.o.b. Pittsburgh. Higher prices for Rails are probable.

Pipes and Tubes.—Last Saturday the Pipe makers made another advance in prices of about 10 per cent. The situation in the Pipe trade is that most of the mills have about all the tonnage on their books they can take care of this side of July, and orders which they may enter would have to go over into second half of the year. With the uncertainty as to prices of Bessemer Pig and Billets in second half, the Pipe mills are taking precautions and have advanced prices to a point where they will be protected, to some extent at least. There is an enormous demand for all kinds of Tubular goods and none of the mills can make early deliveries. There is an inquiry in the market for 45 miles of 10-inch, but it has not been placed for the reason that the buyer has not found a mill that can make deliveries wanted. We quote Butt and Lap, Black and Galvanized Pipe, at 60 per cent. off, with five 10's additional, for less than carload lots, f.o.b. makers' mill, and an extra 5 per cent. in carload lots, delivered in free districts. We quote Screw and Socket Joint Casing at 52½ and 10 per cent.; Inserted Joint at 52½ per cent. with an extra 5 per cent. to dealers. Another advance in Boiler Tubes is expected at an early date. We quote: 1½ to 1½ inch, 50 per cent. off list; 1½ to 2½ inch Iron, 60 per cent.; Steel, 65 per cent.; 2½ to 5 inch Iron, 65 per cent.; Steel, 67½ per cent., with an extra 5 per cent. to dealers.

Iron and Steel Skelp.—The Skelp market is difficult to quote. Some mills are filled up and are asking prices that are a good deal above the actual market. On Sheared Steel Skelp, on account of the condition of the Plate market, very high prices can be had, and for prompt delivery very close to 2c. is quoted. All the Skelp mills are filled up for the next two or three months, and it is difficult to get deliveries on contracts. We have advanced prices and

now quote: Grooved Steel Skelp, 1.30c. to 1.35c.; Sheared Steel Skelp 1.50c. to 1.75c., depending on delivery; Grooved Iron Skelp, 1.40c. to 1.50c.; Sheared Iron Skelp, 1.50c. to 1.60c., all f.o.b. Pittsburgh, four months, or 2 per cent. off for cash in 30 days. As noted above some mills are quoting considerably higher prices. We note a sale of 500 tons of Grooved Iron Skelp at 1.40c., delivered, Pittsburgh.

Machinery Steel.—Prices have again sharply advanced. Mills are filled up and are from four to six weeks behind in deliveries. We have advanced prices and quote: Machinery Open Hearth Steel, Soft, 2c.; Hard, 2.25c.; Crucible, 4c.; Spring Steel, Common, 2.25c.; Crucible Analysis, 2.75c.; Genuine Crucible, 3.50c.; Toe Calk Steel, 2.25c.; Pick Steel, Open Hearth, 3¼c.; Crucible, 4.50c.; Cant Hook, Open Hearth, 3¼c.; Crucible, 4c.; Wedge Steel, Open Hearth, 3¼c.; Crucible, 4c.; Tire Steel, ¾ x 3-16-inch and heavier, 2.10c.; Plow Slabs, 3-16-inch and heavier, 4 inches wide and over, Bessemer Open Hearth, 2.50c.; Hard Open Hearth, 3c.; Crucible Analysis, 3.25c.; Genuine Crucible, 4c.; Lay Steel, Rolled, 3¼c.; Hammered, 4c. The above prices are f.o.b. Pittsburgh.

Connellsville Coke.—Contracts for strictly Connellsville Furnace Coke for delivery in second half of the year have been made at \$1.75 a ton at oven. The demand for Coke is enormous and additional ovens are being fired almost every day. Last week 16,031 ovens in the Connellsville region were active and 2612 idle, the output being 167,240 tons. Recently a number of works in the Connellsville region were operated on Sundays in order to catch up with orders. We quote strictly Connellsville Furnace Coke for delivery in second half of the year at \$1.75 a ton. Foundry Coke is higher and full circular prices are being obtained. We quote at \$2.15 to \$2.30 per ton.

Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, CINCINNATI, March 15, 1899.

The Pig Iron market is in a rather demoralized condition just at present. Extreme anxiety on the part of buyers is the most striking feature. The fact that there is an actual shortage of Iron is becoming more evident every day. Instances are frequent where furnaces have named scare prices to discourage buying with the result of promptly placed orders. In this way an order for No. 2 Foundry was taken yesterday on the basis of \$12, Birmingham. Prices are absolutely a secondary consideration. There has been quite a good lot of Pig Iron sold during the past week, most of it for delivery throughout the next four months. Inquiries for delivery throughout the year are very heavy, though furnaces are showing caution in loading up for such an extended time. There is very little complaint regarding car shortage except in Coke circles. Prices continue to advance, and to-day all furnaces both North and South are asking about 50c. more per ton than they were a week ago. The actual consumption is growing, and prices at the foundries and mills are very stiff. Wages are also on the advance. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$14.50 to \$15.00
Southern Coke, No. 2.....	14.00 to 14.50
Southern Coke, No. 3.....	13.25 to 13.75
Southern Coke, No. 1 Soft.....	14.50 to 15.00
Southern Coke, No. 2 Soft.....	14.00 to 14.50
Southern Coke, Gray Forge.....	12.75 to 13.25
Southern Coke, Mottled.....	12.75 to 13.25
Ohio Silvery, No. 1.....	15.00 to 16.00
Ohio Silvery, No. 2.....	14.50 to 15.50
Lake Superior Coke, No. 1.....	15.00 to 15.50
Lake Superior Coke, No. 2.....	14.75 to 15.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$15.25 to \$15.75
Lake Superior Car Wheel and Malleable..	15.75 to 16.25

Plates and Bars.—The market is very feverish, with buyers extremely anxious to place orders. Mills here are not looking for any except nearby delivery. The demand for Architectural Iron is very heavy, and prices are correspondingly strong. There is no quotable advance in price, though sellers have every advantage in trading. We quote, f.o.b. Cincinnati: Bars, wholesale, 1.35c. to 1.45c., with half extras; Bars, retail, 1.50c. to 1.60c., with full extras; Plates, 2c.; Bar Angles, 1.55c. to 1.60c.; Sheets, No. 27, 2.35c. to 2.40c.; No. 10, 2.10c.; No. 16, 2.25c.

Old Material.—The market is very active, and prices are strengthening. At this date the situation is strong at the following prices, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, \$13 to \$13.50, net; Cast Scrap, \$10 to \$10.50, gross; Car Wheels, \$12.50 to \$13, gross; Iron Axles, \$16.50 to \$17, net; Iron Rails, \$15 to \$15.50; Steel Rails, \$9.50 to \$10.

John W. Gates denies the truth of a report that he with H. F. De Bardeleben and others have acquired the Lady Ensley furnaces at Sheffield, Ala., or ore and coal property in that vicinity.

Philadelphia.

Office of *The Iron Age*, Forrest Building, 1
PHILADELPHIA, PA., March 14, 1899.

The market has not changed very much during the week, but prices are still hardening, and whatever changes have been made have been invariably in sellers' favor. Sellers are just as much befogged in regard to prices as buyers are, however, and to use a common expression, not a few of them admit that they are "going it blind." Applications for material are either not quoted on at all or are quoted on at figures which they hardly suppose will be accepted. In most cases the order comes at once, and if no quotation has been made a request is made to "fill the order at your own price, providing deliveries can begin at once." With such an enormous output as we are having, and with the increase which is being figured upon in the not very distant future, it is astounding how much material is being taken at prices 30 to 50 per cent. higher than were ruling a few months ago, and so far there are no signs of the market being overdone. Under these conditions it is no wonder that manufacturers are bewildered. A careful canvass of the situation among leading houses in the trade brings in substance only one answer. They say: "We did not expect a rise like this, yet the market gets stronger every day. The demand shows no signs of satiety, and it looks like still higher prices. The shortage is immense, and no matter what figures we name we are almost invariably taken up on them." In answer to an inquiry as to when they think a turn in the market will come, they reply: "It is utterly impossible to tell. We have no data to go by, and all we know is just what may turn up from day to day. The high prices we quote almost startle us, yet when we attempt to buy material to cover we find there is not much in it for us. Our price is none too high, and perhaps before we are through with it it may prove to have been too low." There is no doubt that the situation is extremely complicated, and to attempt to predicate its movements at this stage of the proceedings is beyond any man's ken, and no one recognizes that fact more than those who are heavily interested in the business. Sales during the week have been quite important, running more particularly, however, to specialties, such as Low Phosphorus and Basic Pigs, although in all lines sellers could find a market for whatever they choose to put a price on, and in that condition the market remains at this writing.

Pig Iron.—There is still a surprisingly heavy demand for Pig Iron and at improving prices. The gain for the week is probably 25c. to 50c. per ton, but in some cases buyers have paid a clean dollar more than they paid the week previous for precisely the same iron. The fact of the matter is that sellers are in a position to name their own figures, and buyers seem glad to get their orders placed without much dickering as to price. A large number of orders are in agents' hands waiting for quotations, which under existing conditions cannot be given without referring them to headquarters, for which reason there is a feeling of uncertainty which keeps the trade in a constant state of anxiety. The impression gains ground that advancing prices will be met with for some time yet, estimates varying from \$1 to \$3 or \$4 per ton before midsummer is reached. No one here appears to figure on a decline; the most conservative, in fact, look for firm and possibly higher prices, but lower prices are regarded as out of the question unless something unforeseen occurs. A great deal of business has been done in special grades. Basic at \$15 and Low Phosphorus at prices in proportion, lots of from 5000 to 10,000 tons each of these grades having been taken. Mill Irons are also badly wanted, and in some cases decidedly higher prices have been realized. It is difficult to quote very close to the market, as a price of to-day is frequently no price for to-morrow, but the following are a fair average of to-day's market for seaboard deliveries or equivalent points: No. 1 X Foundry, \$16 to \$16.50; No. 2 X Foundry, \$14.75 to \$15.50; Plain, \$14.25 to \$14.50; Standard Mill Iron, \$13.75 to \$14; Basic, \$15 to \$15.25; Low Phosphorus, \$18.50 to \$19.50.

Billets.—The shortage of Steel seems to be as great as ever, but has been measurably relieved by sales from Eastern mills, one order having been placed for 5000 tons at about \$25.50, delivered to a Schuylkill Valley mill. Western Steel is quoted at over \$26, but there is practically none for sale.

Plates.—There is only one story in regard to Plates, and that is that if mills could accept all the orders offered to them they could almost double their business. All classes of buyers are in the market, but the boiler trade shows exceptional activity, which is regarded as the best indication possible of the genuineness and the widespread improvement in business. More power is

wanted everywhere, and as a prerequisite more and larger boilers are called for with great urgency. Prices are supposed to be about as follows for good sized lots, seaboard deliveries, but more money is frequently paid to secure March or April shipments: ¼-inch and thicker, 1.90c. to 1.95c.; Shell, 2.05c.; Flange, 2.25c.; Fire Box, 2.35c. to 2.45c.

Structural Material.—In common with all other departments there is a great rush of business. Prices are liable to be advanced at any moment, although official quotations cut no figure these days. It is a question of delivery more than of price, and if the former can be arranged one-tenth or two-tenths in price is no great obstacle to business. For the present last week's quotations are supposed to be in force, which are as follows: Angles, 1.43c.; Beams, 15-inch, 1.53c.; Tees, 1.58c.; Zee Bars, 1.57c.; Bulb and Deck Beams, 1.73c.

Bars.—The demand exceeds anything that has ever been known, and orders are turned down which under other conditions would be considered as of the most desirable character. Officially prices are unchanged, but a good deal of business is being done on private terms, which, under existing circumstances, means more money. Prices for seaboard or equivalent deliveries in carload lots and upward: Ordinary Bars, 1.30c. to 1.35c.; Refined Bars, 1.40c. to 1.50c.; Test Bars, 1.60c.; Steel Bars, 1.50c. to 1.55c.

Sheets.—Prices are still advancing and mills are simply snowed under with orders. The demand is unprecedented and seems to increase rather than diminish, prices having no influence in checking the ardor of buyers. Prices are quoted as follows for best makes (Common Sheets about two-tenths less): No. 10, 2.25c.; No. 14, 2.35c.; No. 16, 2.50c.; Nos. 18-20, 2.70c.; Nos. 21-24, 2.80c.; Nos. 26, 27, 2.90c.; No. 28, 3c.

Old Material.—It is quite impossible to keep in close touch with prices of Old Material. What may satisfy one holder may be a long way from satisfying another, and as material is sometimes more needed in some cases than in others, prices are liable to a very wide range, according to the circumstances surrounding each particular transaction. As near as can be given values to-day for deliveries in buyers' yards are about as follows: Cast Borings, \$9 to \$9.25; Wrought Turnings, \$10 to \$10.25; Machinery Cast, \$11.75 to \$12.50; Old Car Wheels, \$14.50 to \$15; Heavy Steel Scrap, \$13.50 to \$13.75; Steel Rails, \$14 to \$14.50; Iron Rails, \$17 to \$17.50; Choice Railway Scrap, \$15.75 to \$17; Iron Axles, \$17.50 to \$19; Steel Axles, \$14.50 to \$15.

Baldwin & McInnes have been appointed the agents for the Ball Engine Foundry Company of Erie, Pa., for the sale of their special strong castings in Pennsylvania, New Jersey and Delaware. These castings are said to be especially adapted for valves and fittings for refrigerating machines for high pressure where water, air and ammonia gas are required.

H. M. Shimer & Co. are a new firm of smelters and refiners of base and composite metals, their place of business being 1128 Cherry street. These gentlemen—H. M. Shimer and William H. Kline, the owners—are well equipped for carrying on this line of business, and with their complete facilities are expected to command a good share of patronage in smelting and refining.

Morris Wheeler & Co. of this city have appointed Ernest W. Ryder, Jr., 39 Cortlandt street, as their New York representative in place of the late Joseph P. Mason. Mr. Ryder was brought up in the New York offices of the firm, both at 14 Cliff street and 28 Reade street, and was for seven years in the New York office of the Pottstown Iron Company, so that they believe that he is fully equipped to serve the interests of the trade in the New York market.

(By Telegraph.)

The market maintains its advancing tendency and prices in the majority of cases are higher than indicated by the mail report. No. 2 Foundry sells at \$15.25 to \$15.50, Mill Irons at \$14.75, but offerings are light and prices look like going still higher. Bars are now 1.5c. as a minimum. The meeting here to-morrow will probably make official announcement of a general advance. Very little Steel Billets are offering, with bids at \$26, but holders quote \$27 for limited quantities only. The general opinion here is that the upward tendency will be maintained. Reactions at present are regarded as very improbable.

Birmingham.

BIRMINGHAM, ALA., March 13, 1899.

One in quest of accurate information concerning the Iron market has anything but an easy job. Prices fluctuate more or less with an upward tendency, and many of the sales are at prices withheld from publication. The market is somewhat spotted. Some districts, where buyers paid no heed to the cry of "Wolf," till it was right at 'em, and allowed their stocks to be depleted, were confronted with bare stocks and a rising market. There was nothing to do but take the offerings at sellers' prices. This they have been and are doing yet. The avidity with which offerings are snapped up is evidence indisputable of their necessities. Those who have kept on buying and maintained partial supplies are not yet quite so keen, and frequently run from the price. But they come back and pay a little more when they conclude there is no use waiting. This is about the way the two classes of buyers have come into the market. Both found out there was no money in waiting and they were compelled to have the Iron. The result has been a fairly active market and one satisfactory to the sellers, as at prevailing prices there is some profit to them. As to values, Gray Forge can be quoted at \$10. It has sold at that and also at higher prices. Foundry Forge has sold at price of Gray Forge and also at 25c. above it. No. 3 Foundry has sold at \$10.50 and some at higher value. No. 2 Foundry has sold at \$11. That is the current quotation. But it, too, has commanded better figures. Just what proportion of the sales has commanded prices above the inside figures given is not ascertainable by any correspondent. The above figures can safely be taken as inside values. The market has a hardening tendency, and at the advanced prices there is less hesitation on the part of buyers than when values were materially lower. But few, very few, orders of magnitude have been accepted. In nearly every case they have been more or less "scaled down" in order to effect a wider distribution. It was the application of the old saying, "A half loaf is better than no bread." The week closed with some export inquiries on the market, but no transactions were reported as concluded. Warrants were offered during the week at \$9.50 for Gray Forge, \$9.75 for No. 3 Foundry and \$10 for No. 2 Foundry. But one sale reached publicity, and that was 20,000 tons, made up of 5000 tons each of Gray Forge, Foundry Forge, No. 3 Foundry and No. 2 Foundry—a very desirable lot. It was for account of an Eastern estate. The buyer was not divulged. A large proportion of the sales made was for the last half of the year deliveries, while those who had any for spot or near by delivery commanded strict attention. It seemed to be not so much a question of price as a question of Iron. Many small orders came in and were very acceptable, as there was less strain in filling them. The delivery of the 20,000 tons mentioned above, and which was purchased to melt, will reduce stocks in warrant yards to approximately 60,000 tons.

Preparations are being pushed on the repair of the Vanderbilt Furnace, but it cannot be made available until the last half of the year. Its capacity will be increased. An option has been given on the Talladega Furnace, which is said to be in fair condition and can in a short time be put in "apple pie" order. The No. 2 Alice Furnace will again be put in blast, using boilers, engines and necessary machinery of the furnace at Cowan, Tenn., owned by the Tennessee Company. A force of men have been sent there to dismantle and ship to this point what may be available and desirable. This takes time, and it is hardly probable that No. 2 Alice will be active before June. We are to have a new cooperage plant at Ensley City, which will be removed from Ashland, Ky. This plant has already contracted to furnish the Rod, Wire and Nail mill 3000 kegs per day. Then the Cole Mfg. Company of Newman, Ga., after a personal investigation of the conditions here, have finally concluded to start a branch here which will, in time, absorb the present one at Newman. It is a foundry and machine business, one of the largest in the South, and in capital and credit rated high. There are persistent rumors of other large plants to be located here, the character of some being carefully kept secret, while others are not yet ready to be announced. But they are sure. The source of information is reliable and the investment represented is \$5,000,000 to \$6,000,000. In Coal mining efforts are unrelaxed to make the output as large as facilities will permit, and for a large summer business the prospect was never better. The Rolling Mills still report an active business. It is current rumor that they are putting their houses in order preparatory to turning over the management to "the Trust." The talk is that the mills here, owing to their location, will be kept continuously at work and many new and needed improvements will be added, promoting efficiency and economy in cost of work.

In real estate there is developing more activity. Sales for investment are increasing and prices show a moderate increase. All our industries continue busy and work is constantly coming in. The Birmingham Foundry & Machine Company closed a contract the past week for two engines for local account aggregating 1500 horse-power. The Birmingham Boiler Works have just completed their Summit, Miss., contract and are installing 32 gas producers at the Ensley Steel Mills, besides having their hands full of other work. The Warrior Machine Works have a contract with Tuskegee, Ala., account of water works, and report a very active demand for and good sales of Worthington pumps. Our Brass foundries report large accumulation of orders. In all lines is evidence of business activity, and complaints, when any, are traceable to inertness. The "up and doing" firms are full of business, with prospects bright for its continuance.

Cleveland.

CLEVELAND, OHIO, March 14, 1899.

Iron Ore.—The market, both as regards the prices for the Ore itself and the carrying charges in connection with its transportation, continues to grow in strength day by day. There is, of course, very little Ore on the market, but sales have been made within the past few days by Pickands, Mather & Co. and other firms at a conservative advance over association prices. No additional charters of vessels for the lake transportation of the Ore have been reported, but it is certain that no more are, or will be, on the market at 65c., a figure which, when it was reported last week, caused considerable surprise in some quarters. Reports circulated last week to the effect that 70c. had been paid on season charters seem to be unauthenticated, but the dispatch sent by one prominent owner of a number of vessels, who wired his agent not to communicate with him until he could secure 75c. for charters running to October 1, well illustrates the general feeling among vesselmen who have not tied up to 60c. contracts. The more confident vesselmen are arguing the opinion that offers of 75c. or 80c. on season contracts should be expected, and it will not be surprising if the "wild" rate goes to almost any figure. They justify this opinion not only by the general conditions prevailing in the Iron and Steel trade, but by the fact also that the elevators at Duluth and Chicago are full of grain. Ore shippers, on the other hand, are manifesting a disposition to hold off a while and await events. They take the stand that the great amount of vessel capacity that has been covered at 60c., together with the limitation of the output of the mines by reason of the inadequate supply of labor, ought to tend to keep the "wild" rate within reasonable bounds, and the rate for season charters, if their premise is sound, ought not to go above 70c. for contracts running to October 1. They have an additional object in holding off in an anxiety that the Coal situation shall develop further before they make further charters, and they think that some influence will be exerted by the fact that many joint charters for Ore and Coal are likely to be made.

Meanwhile the situation at both ends of the lakes continues to receive attention. Shippers claim that although the unusual severity of the winter has resulted in stock piles at the head of the lakes being frozen to a perhaps unusual extent, there will be no inconvenience resultant, inasmuch as it will be possible to work along by having the output of the mines day by day turned directly into the docks for use in loading the vessels. Meanwhile a new opposition to the scheme of day and night work on the docks at Lake Erie ports has developed in the form of some railroad interests. Many roads, such as the Pennsylvania, have heretofore transported at night the greater part of the Ore unloaded from boats during the day, and it is claimed that were night work carried on much Ore would, of course, have to be shipped during the day, to the severe detriment of the passenger and other regular traffic. Under these circumstances the Carnegie road, which takes small regard of passenger business, would have a decided advantage, and this would, of course, be enhanced by the 1000 new steel cars which it is now announced will assuredly be ready by the opening of navigation. Insuring good dispatch on the dock. Eight conveying and direct unloading machines—which are not, however, new—manufactured by the Brown Hoisting & Conveying Company, are being installed on the Carnegie docks, as are also two Thew automatic shovels of special design for use in loading from stock piles to cars. Another phase of the railroad transportation end of the business, in which the railroads themselves will endeavor to effect a reform, is in the matter of making large shipments at one time to any single furnace, thus tying up cars for a considerable time unless the unloading facilities at the furnaces be

of unusual capacity. The opening of navigation is another question which is the subject of some discussion and the general surmise is that it will be several weeks later than last year. Gossip continues as to the disposition of mining property. A rumor in circulation to-day is to the effect that the Lake Superior Iron Company's mine, for the sale of which negotiations have been supposed to be pending with either the National Steel Company or the American Steel & Wire Company, is in reality sought by the old owners of the Norrie Mine.

Pig Iron.—The sale of 20,000 tons of Bessemer last week at \$13.50, Valley furnace, has perceptibly strengthened the market and is rather expected to be partially instrumental in causing another sale at higher figures. Foundry Iron is strong at \$13.50 for No. 1 and \$13 for No. 2. No date has yet been fixed for another meeting of the Bessemer Furnacemen's Association and no quotation of prices whatever has been made for the third quarter. The best informed men here, while not inclining to the opinion that the present flurry in Pig Iron will be over as soon as the idle furnaces have been put into blast, still maintain that there is small ground for the assertions which have been made to the effect that it will be a long time before production will again overtake demand. Their contention is that future demand is too uncertain a quantity to warrant such confidence and the majority are not enthusiasts for \$20 Pig Iron. An even advance is looked for to prevail during the balance of the year. There can be no doubt that the blast furnaces now under construction in the Cleveland district will, when they are put into blast, exert quite an influence on the situation, for the simple reason that these four stacks will have a capacity of fully 4600 to 4700 tons per day, which is equal to that of 12 ordinary Mahoning Valley plants. The two furnaces of the Lorain Steel Company will be ready to be put into blast on May 1, while the two building by the Ohio Steel Company of Youngstown will follow some time during the month of January next. A new furnace at Buffalo, which will be ready this summer, may be counted on for 250 tons per day, while the old Douglas and Scottdale furnaces, which will begin producing with the opening of navigation, may be expected to add between 350 and 400 tons daily to the aggregate. On the other hand, in all considerations of what may be expected from new furnaces or the resumption of the operation of idle ones, there comes the old question of the supply of raw material. Opinions on this are widely divergent and range all the way from the conservative, who anticipates no increase over last season, to the man who believes that with a little easing of the stress of the labor situation the mines can get out during 1899 fully 16,000,000 tons.

Finished Material.—Prospective buyers experience some difficulty in securing quotations on many kinds of Finished Material. The talk of a combination is having some effect on Plate prices, or, rather, is adding to the difficulty of securing any quotations whatever. The general opinion of Finished Material men is that prices will go some higher and will then sag back. Bar Iron, out of stock at Cleveland, is quoted at 1.35c., half extras, and a price of 1.60c. is being made on Steel Bars. No. 27 Sheets are quoted at 2.80c. The extreme activity of demand would seem to warrant the withdrawal of prices made this week. The situation in Structural Material remains practically unchanged, so far as prices are concerned, the same quotations, given two weeks ago still prevailing. The Carnegie Company have just booked an order for 500 tons for delivery in Western Ohio. Inquiries for prices for the third and fourth quarters continue, the Carnegie Company reporting that they have during the past few weeks refused orders for more than 15,000 tons of Sheet Bars for delivery during the latter half of the year. The Structural mill of the Cleveland Rolling Mill Company broke down a few days ago, as a result of an accident to the engine which will require some time for repairs. The company, have, however, managed to take care of all the orders on hand by arrangement with outside firms. Decision has been reserved as to whether the company will resume the manufacture of Beams when the mill is again ready for operation. No transactions have been reported in Ship Plate, but upon an inquiry from Pittsburgh a quotation of 1.70c. was given. The removal of the offices of the American Steel & Wire Company having been completed, the headquarters remaining at Cleveland are simply those of the Ohio corporation and all quotations are made from New York or Chicago.

Old Material.—The situation in the Old Material market is, to say the least, unusual and continues to grow so almost daily. It is almost impossible for any dealer to make quotations on the basis of actual sales for more than one or two grades, by reason of the exceptional demand and a more than correspondingly limited supply. This has been caused in a considerable degree by the inability of the rolling mills to secure an adequate supply

of Steel and their consequent dependency to a greater or less extent upon Scrap. Even if the price of Gray Forge be not prohibitive, the available supply is very much restricted. The shortage in the supply is due, of course, in a measure to the unusual demand, but a contributory cause is also to be found in the severity of the winter, which has seriously interfered with the gathering of Scrap. In view of the latter fact it may be expected to come in a little more freely later. Prevailing quotations are as follows: Steel Melting Stock, \$13; No. 1 Wrought, \$15; No. 1 Cast, \$12; Car Wheels, \$15.50; Cast Borings, \$7; Turnings, \$8.

The German Iron Market.

ESSEN, March 2, 1899.—The event of the past month has been the final settlement of the German Beam Syndicate, and the change from the somewhat loosely knit Billet Pool into a Slab Selling Syndicate. For the present both syndicates will probably not have much opportunity to make their existence felt, since the works are sold out until at least the end of 1899, and since sales for 1900 will probably not be taken up at an early date.

The strength of the Iron and Steel market has found expression since our last report in a series of further advances in prices. The feeling is one of extraordinary strength and firmness, and it is believed out of the question that any reaction is possible during the current year. To enter into any prophecies for the next year has little object at the present time. The consumers appear to look forward with confidence, which is evidenced by the fact that they are beginning to attempt to cover beyond the current year.

The Slegen Ore market has been quiet for some time past, since the output of all the mines has been sold up to April 1, 1900. The Selling Syndicate found it impossible to meet all the demands which have come to hand. The mines are strenuously endeavoring to increase their production in order to meet the urgent requirements of the blast furnaces. Prices have remained unchanged.

Many of the works are still short of Mill Iron and Steel Iron for the fourth quarter of 1899, and some plants which did not cover their requirements of Pig Iron early enough for the third quarter are now in a great deal of difficulty. The Luxemburg Pig Iron Syndicate has stopped its sales altogether for some time, and the Rhenish Westphalian Syndicate is endeavoring in vain to get some of the constituent plants to accept further orders. Such condition of affairs has not been witnessed before.

Official prices are 68 to 69 marks for Spiegeleisen, f.o.b. Slegen. German Bessemer Pig, 70 marks, f.o.b. furnace; Thomas Iron, f.o.b. Steel Works, 62 marks; Luxemburg Mill Iron, 52.80; Luxemburg Foundry Iron, 60 marks; German No. 1 Foundry Iron, 69 marks; No. 3, 64 marks, and German Bessemer Pig, 70 marks, f.o.b. furnace. English No. 3 Foundry Iron is quoted 68 marks, f.o.b. Ruhrort.

Prices for Pig are steady in Old Material. Old Iron Rails are quoted 92 to 93 marks; Ties, 82 to 86 marks; No. 1 Wrought, 58 to 60 marks. Muck Bar continues very scarce, and a famine seems likely in spring, when puddling begins to slacken.

The famine in Steel Billets, &c., continues, and the Rod mills in particular are suffering severely. Recently negotiations pending since November for 100,000 tons of Billets have been finally concluded at the reported price of 97 marks per ton. The Rod mills had asked for at least double the quantity, but that could not be arranged for. The quantities of Billets placed thus far do not meet the requirements of the Wire mills, whose operations are in consequence thereof very irregular. The official price for Billets is 97 marks, but sales have taken place at 100 to 105 marks. Blooms are quoted 92 to 95 marks; Slabs from 99.50 to 102.50 marks per ton, f.o.b. Dortmund, Ruhrort, Rotheerde and Diedenhofen. The Pig Syndicate prices for the present had gone to the price of 108 marks per ton, f.o.b. Buhrbach. In consequence of the strong demand from domestic and foreign sources almost any price is paid for quick delivery of Bars. The average quotation is 145 to 150 marks per ton. In Hoops and Bands prices have also risen, and a heavy amount of work has been placed at 145 to 147.50 marks per ton. The Pipe mills have further reduced their discount $2\frac{1}{2}$ per cent., so that prices are now close to those ruling last fall before the lowering due to American competition. Skelp is sold at 150 marks, but the quantity offered is not by far adequate to meet the requirements of the Pipe mills. The demand has developed also in Sheets, and prices have been raised without any difficulty to 155 to 160 marks per ton. Plates have advanced 10 marks per ton during the last month, and Steel Tank Plates are 147.50 marks; Iron Tank Plates, 170 to 180 marks; Steel Boiler Plate, 170 marks, and Wrought Iron Boiler Plate 200 marks.

The syndicate has closed its sales for the second quarter of 1899. For Steel Rods and for Iron Rods the

price has risen to 152 to 155 marks, practically everything being closed out. The prices for Cast Iron Pipe have advanced notably during the past month. Orders are coming in at an extraordinary rate.

New York.

Office of *The Iron Age*, 232-238 William street, {
NEW YORK, March 15, 1899. }

Pig Iron.—There has been continued pressure on the part of consumers and under it prices have been further advanced by the few who have any Iron for sale for prompt or early delivery. There has been a considerable movement in warrants, both privately and on the Consolidated Exchange. In one case Lehigh Valley Iron was sold which has been in storage for ten years past. We quote as follows: Lehigh and Schuylkill Irons, No. 1 Foundry, \$15.50 to \$16; No. 2 X, \$15.25 to \$15.50; No. 2 Soft, \$15 to \$15.25; No. 2 Plain, \$14.75 to \$15, and Gray Forge, \$14.75 to \$15. Southern brands are quoted: No. 1 Foundry, \$15.25 to \$15.75; No. 2 Foundry, \$15 to \$15.25; No. 1 Soft, \$15 to \$15.25; No. 2, \$14.75 to \$15, and Gray Forge, \$14.75 to \$15.

Cast Iron Pipe.—There have been no large lettings recently which might be considered indicative of the position of the different interests. Only small contracts have been closed, at which the prices were irregular. The tendency, however, is distinctly upward and \$22 to \$22.50 per gross ton, tidewater, may be quoted. A few days since a list was published of the Board of Directors of the U. S. Cast Iron Pipe & Foundry Company, but as yet this matter has not been settled. The parties in interest are to meet to-morrow and the organization is to be perfected in a few days. Samuel Thomas will probably be president and Colgate Hoyt will be a member of the board.

Steel Rails.—Eastern mills report no sales of any consequence. The market, however, is much higher and small lots have sold at \$26 and \$28 for Standard Sections.

Track Fastenings.—We quote: Angle Bars, 1.30c. to 1.35c.; Spikes, 1.65c. to 1.70c., and Bolts and Nuts, 2c. to 2.10c.

Finished Iron and Steel.—No large contracts have been closed in the local market. Prices are higher and we quote as follows: Beams, 1.55c. to 1.65c.; Angles, 1.45c. to 1.50c.; Universal Mill Plates, 1.85c. to 1.95c.; Tees, 1.55c. to 1.60c.; Channels, 1.55c. to 1.60c.; Steel Plates are 1.85c. to 1.95c. for Tank, 2c. to 2.05c. for Shell, 2.20c. to 2.25c. for Flange, 2.30c. to 2.35c. for Fire Box and 2.40c. to 2.50c. for Locomotive Fire Box, on dock. Refined Bars are 1.40c. to 1.50c. and Common Bars are 1.25c. to 1.35c., on dock. Soft Steel Bars, 1.40c. to 1.50c.; Steel Axles, 1.65c. to 1.75c.; Scrap Axles, 1.75c. to 1.90c.; Links and Pins, 1.65c. to 1.70c.; Hoops, 1.35c. to 1.40c.; Best Iron Boiler Rivets, 2.25c. to 2.50c., delivered; Steel Structural Rivets, 1.75c. to 1.85c.; Cotton Ties, 55c. to 65c. per bundle, at mill.

Metal Market.

Office of *The Iron Age*, 232-238 William street, {
NEW YORK, March 15, 1899. }

Pig Tin.—The market here sold as low as 23.55c. during the last week, but closed firmer to-day at 23.80c. to 23.90c. for spot and 23.70c. to 23.80c. for March and April. There was very little business doing at any time throughout the week. The London market fluctuated just as widely as did this market, and after selling down to £106 on Friday last it gained gradually and had advanced to £108 2s. 6d. at the close to-day. Futures were quoted £108 12s. 6d. Shipments from the Straits during the first half of this month amounted to about 2000 tons, as against 2720 tons for the same period of last year.

Copper.—The market here was very dull, and an easier tone prevailed. Spot delivery is still firm, however, and difficult to obtain. Spot Lake Superior Ingot is quoted 17½c.; Electrolytic, 17c. to 17¼c., and Casting, 16½c. to 17c. Futures are much easier and deliveries for late in this month and for April are offered at concessions. One concern offered Lake Copper for April, May and June delivery at 17c. London fluctuations during the week have been wild. On Thursday last the market closed £69 15s.; on Friday the 15 shillings had been dropped and the quotation was £69. Monday's quotation was £67 12s. 6d.; yesterday a further decline saw the figure £66 10s., and a sudden jump to-day closed the market at £68 17s. 6d. for spot and £69 for three months' futures. Best Selected declined to £71 15s.

Pig Lead.—Since our last writing the market here has advanced to 4.45c. for spot and 4.42½c. to 4.45c. for March and April delivery. The market closed at these figures to-day, with general tone rather dull. St. Louis reports a quiet but steady market at 4.25c. London has advanced to £14 2s. 6d. for spot Soft Spanish.

Spelter.—Has become a little firmer and spot is quoting at 6.30c. to 6.35c. March and April delivery is 5c. lower, and St. Louis reports a firm market at 6c. London quotations at the close came a little stronger, with £27 2s. 6d.

The Ore market is very active, with an exceedingly large production. Best grades are still \$43.

Antimony.—Remains unchanged. Hallett's is strong at 10c., and Cookson's is firm at 10c. to 10¼c.

Nickel.—Is strong and prices for small lots, which are about the only business doing, are firm at 38c. to 40c., according to quantity and delivery.

Tin Plates.—For spot stock the situation remains unchanged. The American Tin Plate Company will not quote on anything this side of June. We understand that they are, however, quoting for the last half of this year, and that the price quoted is on a basis of about \$4.10 per 100-pound box, New York. It is said that a certain concern have in anticipation of further advances by the company ordered something like 120,000 boxes for importation.

International Steam Pump Company.

It is stated on excellent authority that application will be made in New Jersey to-day for the filing of a charter by the International Steam Pump Company. The company will be capitalized at \$27,500,000, which will be divided into 125,000 shares of 6 per cent. cumulative preferred stock and 150,000 shares of common stock.

The new company will be a consolidation of the five leading steam pump manufacturers in this country. They are Henry R. Worthington, Blake & Knowles Steam Pump Works, Limited, Deane Steam Pump Works, and the Snow Steam Pump Works. These companies are estimated to transact 90 per cent. of the steam pump business in the United States, exclusive of high duty engines. The majority of the companies also manufacture such engines.

For the present the plants will continue to operate individually on exactly the same lines on which they have been working. Competition will, however, be eliminated to an extent by establishing uniform price-lists. The various branch offices of the companies will for the present be continued.

Charles C. Worthington of the Henry R. Worthington corporation will be the president, and Max Nathan, who is president of the Nathan Mfg. Company and is also connected with the Ludlow Valve Mfg. Company and the George F. Blake Company. The other directors are Charles L. Broadbent, vice-president of the George F. Blake Company; Lewis E. Bellows, of the Deane Steam Pump Company; John G. Mackintosh, president Deane Steam Pump Company; Robert Laidlaw and John W. Gunn of the Laidlaw-Dunn-Gordon Company; Daniel O'Day of the Snow Steam Pump Works, and of the Standard Oil Company; James H. Snow; Philip Lehman, banker, of Boston, and Edward F. C. Young, president of the First National Bank.

It is estimated that the companies named transact 90 per cent. of the steam pump business of the United States, exclusive of high duty engines.

The assets of Henry R. Worthington were estimated on April 30, 1898, at \$6,148,355.64, without making any allowance for good will, and the net profits for the year 1898-1899, based on ten months' business, are placed at at least \$550,000.

The assets of the Blake & Knowles Steam Pump Works, Limited, on April 30, 1898, were stated at \$3,178,000, and the net profits, based on ten months' business, are at the rate of \$425,000.

The Deane Steam Pump Works had rated assets of \$1,155,000 on December 31, 1898, and its net earnings during last year were \$111,973.

The assets of the Laidlaw-Dunn-Gordon Company on April 30, 1898, were placed at \$800,000, and their profits for the current business year are estimated at \$70,000.

The Snow Steam Pump Works are stated to have assets of \$700,000, and their profits are placed at \$55,000.

The combined net profits of these five concerns for the year 1898, estimated on the business of ten months of the year, will amount to over \$1,200,000, which is equal to a dividend of 3 per cent. on the common stock of the new company after paying the preferred dividend.

The control of the constituent companies will be taken over free from debt, and with assets valued by the vender companies at over \$12,000,000, in which are included liquid assets amounting to upward of \$4,700,000, consisting of cash, merchandise and accounts, which will furnish ample working capital for the new company.

Out of the authorized capital there will be reserved

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MARCH 15, 1899.

	Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
Am. S. & W., Common.....	191,192	63½-64	63½-64½	63½-64½	64½-66½	63½-65½	62-64
Am. S. & W., Pref.....	39,550	103½-104½	104-104½	104-104½	104½-106½	103½-105½	103-103½
Col. Fuel and Iron.....	11,935	33½-33¾	33¾-34½	34½-34¾	34¾-36½	35-36	34½-35½
Federal Steel, Common.....	69,583	51½-52½	51½-52½	51½-52	52½-53½	52-52½	51½-52½
Federal Steel, Prefer.....	53,041	88-88½	88-88½	88½-88½	87½-88½	87-88	86-87½
Tennessee Coal and Iron.....	50,370	46-46½	46-47½	46½-47½	47½-47½	46½-47½	46½-47½
Cambria Iron, Phila*.....	493	-47½	-47½	-47½	-47½	-47½	-47½
Cambria, Scrip**.....							
Cambria, Steel***.....	24,931	23½-23½	23-23½	23½-23½	23½-24	23½-23½	23½-23½
Penna. Common, Phila.....	5,764	42-43½	45-46½	45-47	47-50	49-50	45-49
Penna. Prefer., Phila.....	350		63½-65		-70	-68	-65½
Tin Plate Common, New York..	63,353	40-41	40½-41½	41½-42½	42½-43½	43½-44	42½-43½
Tin Plate Preferred, New York..	2,677	-95½	95-95½	-95½	95½-96	96½-97	95½-96½
Tin Plate Com., Chic.....	+17,831	39½-40½	40½-41½	41½-42	42-43½	43-43½	42½-43½
Tin Plate Prefer., Chic.....	+3,810	95-96½	94-95½	-95	95-96½	96-97	95½-96½
National Steel Common, Chic..	+33,898	34½-36	37-39	38½-39	38½-40	39½-40	38-39½
National Steel Preferred, Chic..	+9,886	84½-86½	86-87½	86½-87	87½-89	88-89	87½-88½

* Par \$50. ** Par \$100. ***\$1.50 per share paid in. Late Philadelphia and Chicago sales by telegraph.
† Excludes Tuesday and Wednesday sales.

and set apart an amount of preferred stock at par for the retirement of the \$2,000,000 7 per cent. cumulative preference shares of Henry R. Worthington, and \$1,150,000 6 per cent. debentures and \$500,000 8 per cent. preference shares of the Blake & Knowles Company. The vender to the new company will also deposit with the Colonial Trust Company an amount of common stock to facilitate and induce the retirement of these outstanding securities.

It is proposed that the last-mentioned existing securities be retired by the sale or exchange of the preferred and common stock of the new company, reserving, however, to the new company the right to dispose of the securities thus set apart, if not exchanged within a limited time.

In regard to the estimated savings through consolidation, the prospectus says: Each of the five companies now maintain agencies in the principal cities of the United States. The Worthington and Blake companies have stores and carry stocks in London, Paris, Hamburg, Vienna and other cities. Some of them have expensive salaried managers. All these agencies in this and other countries will be consolidated; the stores and agencies maintained in the cities of this country and the forces of clerks, salesmen, &c., necessary to conduct them will be united and decreased, involving an estimated saving of at least \$500,000 per year. The expenses of each company for their drafting department, incident to the elaborate drawings and specifications for estimating on work, when united will bring about a further reduction. The standardizing of the patterns for foreign and domestic work, which is now under way in the Worthington factory, when applied to the entire business of the new company will result in an estimated saving of at least \$200,000 per year.

A conservative estimate of the advantages derived from consolidation is believed to be \$1,300,000 over the present earnings, which would make a total of future net earnings, with the estimated earnings based on ten months of the year's business, of \$2,500,000, or 6 per cent. on the preferred stock and over 11 per cent. on the common stock of the new company.

The principal men connected with the various companies are to contract not to edgage in a like business for at least ten years, and it has been arranged that they shall become identified with the new company. Charles C. Worthington will be the president and Max Nathan the treasurer of the new company.

Iron and Industrial Stocks.

Under the pressure of a firmer money market prices on iron stocks declined somewhat to-day, as shown in the table presented herewith.

The closing quotation on a number of industrial stocks was as follows to-day:

International Silver, Common.....	30	to 30¾
International Silver, 5s.....	..	to ..
Mich.-Peninsular Car, Common.....	37	..
Mich.-Peninsular Car, Preferred.....	97	..
Mich.-Peninsular Car, First 5s.....	100	..
Otis Elevator, Common.....	35	..
Otis Elevator, Preferred.....	89	..
H. R. Worthington, Common.....	50	..
H. R. Worthington, Preferred.....	117	to 120
Cramp's Shipyard Stock.....	76	..
Pratt & Whitney, Common.....	3	..
Pratt & Whitney, Preferred.....	40	..
E. W. Bliss, Common.....	133	..
E. W. Bliss, Preferred.....	125	..
U. S. Projectile.....	90	to 95
Barney & Smith Car, Common.....	23	..
Barney & Smith Car, Preferred.....	..	to ..
Pressed Steel, Common.....	65½	..
Pressed Steel, Preferred.....	88½	..
American Car & Foundry Common.....	30	to 30¾
American Car & T. E. Preferred.....	69	..

Smaller subscriptions are reported to have sold at 115 to-day.

The American Steel & Wire Company have declared their first dividend of 1¼ per cent. on their preferred stock.

The Otis Elevator Company have declared 1½ per cent. on their preferred stock.

Shop Floors.*

The following method of laying brick floors conforms to the generally accepted practice:

Assuming the soil to be firm and well drained, excavate the ground to an even surface 8 inches below grade of desired floor. Tamp well with heavy rammers to secure a firm foundation, then fill in with good clean sand or gravel to within 3½ inches of grade, making a crown of about 2 inches between pits for drainage; wet this down well, tamp with rammers, and trim off with straight edge, taking care to get good even surface brick on edge, close to each other and breaking joints so the tops come one-half above grade. After laying, roll bricks with 2000 or 3000 pound roller, cover the surface with 1 inch fine sand and broom it well into cracks, or fill cracks with cement grout. A concrete foundation is recommended by some, but except in cases where the natural ground is not firm, or where the floor is to be subject to extremely heavy loads, it is not considered necessary.

For blacksmith shops or foundries the natural earth frequently forms a very suitable as well as substantial floor. In localities where the soil is too soft in its natural state, the addition of cinders or clay will solve the problem cheaply and satisfactorily.

In machine shops the conditions are different, and here we find the recommendations almost as varied as are those for round house floors. A brick floor in a machine shop answers many of the requirements, but there is good evidence in support of the objection that men cannot stand all day on such a floor or upon a surface of concrete or asphalt without feeling the bad effects of cold upon the feet. This difficulty is overcome to a large extent by the use of slatted floor racks or platforms at the machines where operatives stand. When machines are set upon a brick floor there should be special provisions made for foundation. But this can hardly be urged as an objection, as it is necessarily the case with heavy machines under almost any circumstances.

A bedded plank floor has recently been laid in an extensive shop plant of the Boston & Maine road. The earth is well compacted and brought to the proper surface and a bed of coal tar concrete put down in three courses. This bed is 4 inches thick when finished. The specifications are that the stones of the lower course shall be not less than 1 inch in diameter, and those of the second course not more than 1 inch in diameter. Stones of each course to be well covered with tar before laying and thoroughly rolled afterward. The finishing course to be composed of good clean sharp sand, well dried, then heated hot and mixed with pitch and tar and brought to a true level to fit a straight edge. Roller to weigh not less than 700 pounds on a length not exceeding 22 inches. On this finished surface of the foundation there is spread a coating ¼ inch thick of the best roofing pitch, put on hot, into which the lower course of plank is laid before it cools. Care must be taken to have the plank thoroughly bedded in the pitch, and, after laying, the joints must be filled with pitch. If vacant places occur under plank they should be bored and filled. The finishing flooring is laid across the lower and thoroughly nailed.

* From a report to the Association of Railway Superintendents of Bridges and Buildings.

For the lower course 2½-inch spruce plank s. l. s. is used, and for the upper 1½-inch s. l. s. spruce plank. It is also noted that the lumber for lower course should be fairly seasoned, and that of the upper course well seasoned before using. The cost of such a floor is given at 18 cents per square foot, using spruce lumber.

For paint shops and car shops a brick floor has been found very satisfactory. The committee believes that a brick floor, generally speaking, is the most economical, durable and satisfactory floor for shops as well as for round houses.

The American Brass Company.

Considerable comment has been caused during the last week on the report of the organization of the American Brass Company. This company were accepted as a combination of the various brass mills located in the Naugatuck Valley, Conn. We have since received an official confirmation of the formation of the company. Although the company are now in existence, they are not yet operating. The organization was a preliminary affair. The gentlemen who constitute the company as individuals are actively identified with six of the most prominent brass mills in the Naugatuck Valley. These mills have not been turned over to the new company as yet, and from various officers of the company we have learned the following:

The charter incorporating the American Brass Company was granted in 1893 by the State of Connecticut. Charles F. Brooker, who is president of the company, was then representing the Torrington district in the State Senate, and the enactment of the document was due largely to his personal efforts.

Within a year or two after the granting of the charter informal overtures were made toward the organization of the company. The attempt was not successful and the matter was held in abeyance.

It was necessary to utilize the charter within four years or it would become void. It was not utilized, but its life was prolonged during the 1897 session of the General Assembly by the passing of a resolution extending the limit to May 1, 1899.

It will be seen, therefore, that in order to obtain the corporate rights conferred in the charter organization prior to May 1 of this year was necessary. This is just why the American Brass Company have been organized at this time.

The six concerns who are represented in the directorate are the Coe Brass & Mfg. Company of Torrington and Ansonia, Conn.; the Scoville Mfg. Company, the Benedict & Burnham Mfg. Company, the Plume & Atwood Mfg. Company, Holmes, Booth & Haydens and the Waterbury Brass Company, all of Waterbury, Conn. These are the concerns who have for several years been attempting to organize for the purpose of self protection and mutual helpfulness. This condition has not yet been attained, although a company have been formed, consisting of individuals who control the six companies. The actual consolidation is, however, nearer consummation to-day than it has been at any time. The conditions in the valley are better now than they ever were. Consequently this is a most favorable time for bringing the affair to a successful issue.

The stockholders of the company are Charles F. Brooker, C. P. Goss, J. S. Elton, E. C. Lewis, E. T. Coe, L. J. Atwood, D. S. Plume, Frederick J. Kingsbury, E. L. Frisbie, Jr., Thomas B. Kent, E. D. Steele and T. Brownell Burnham. Following are the officers and directors:

Charles F. Brooker, president.

C. P. Goss, J. S. Elton and T. B. Kent, vice-presidents.

D. S. Plume, treasurer.

E. L. Frisbie, Jr., secretary.

Charles F. Brooker, C. P. Goss, J. S. Elton, T. B. Kent, D. S. Plume, E. L. Frisbie, Jr., and T. Brownell Burnham, directors.

The powers of the company as outlined in section 2 of the charter are: "Said corporation shall have power and is hereby authorized to manufacture, buy, sell and deal in brass, copper, German silver and metals of all kinds, and all kinds of articles composed wholly or in part of brass, copper, German silver or other metals or materials, and plated wares, and to acquire, purchase, sell and convey, and own and deal in mines and mining property and rights, shares and interests therein, and also shares in any corporation located in this State which is, or may be, hereafter engaged in any similar business with that herein authorized, and also any and all real, personal or mixed property owned, used or occupied by any such corporation; also to make, manufacture, buy,

sell and deal in such other property as said corporation may, from time to time, deem advisable; and to do such other things as are incident to the prosecution of said business, and to exercise such mercantile powers as may be convenient and necessary for the successful prosecution of said business, and in and by said corporate name said corporation shall be and is hereby authorized and empowered to purchase, take, hold, occupy and enjoy to itself and assigns any such property, real or personal, including letters patent, as will enable it to better carry on said business to advantage and the same may manage, control, convey, sell and dispose of at pleasure; and may purchase and hold either directly or through agents or trustees all rights, easements, franchises, stocks, interests and estate that may be advantageous to or convenient in the prosecution of said business, and shall have the right to sell, lease, mortgage or pledge the same, as may from time to time be deemed advisable."

Regarding the powers of the directors: "The directors, for the time being, or a major part of them, shall have power to fill any vacancy which may occur in their board by death, resignation or otherwise, for the balance of the then current term.

"The directors shall have full power to make and prescribe such by-laws, rules and regulations, not contrary to the constitution or laws of this State, or of the United States, as they shall deem expedient, necessary or proper, relative to the disposition and management of the affairs, stock, bonds, property, estate and effects of said corporation, the transfer of shares, the duties and conduct of its officers and servants, the election and meetings of the directors and of the stockholders, and all other matters pertaining to the business, property, conduct and concerns of said corporation; and said directors may allow their officers and employees such salaries as they shall deem just, and they shall have power to make and pay such dividends from time to time as the profits and earnings of said corporation shall enable them to do.

"The directors may call in the subscriptions to the capital stock of said corporation in such instalments, payable at such times and places as they may deem proper, giving such notice thereof as they or the by-laws of said corporation shall prescribe; and in case any stockholders shall neglect or refuse payment of any such instalments for a period of 30 days, after the same shall become due and payable, and after such notice thereof, the stock of such negligent stockholders, or so much thereof as may be necessary, may be sold by the directors at public auction, on giving at least ten days' notice in some newspaper published in said city of Waterbury, in which the principal office of this corporation is to be located, and the proceeds of such sale shall be applied in payment of such instalment or instalments, and the expense attending such sale, and the balance, if any, returned to such negligent stockholder, and such sale shall entitle the purchaser to all the rights of a stockholder to the extent of the shares so bought."

Section 3 provides that: "The capital stock of said corporation shall be \$500,000, which shall be divided into shares of \$100 each, and the same may be increased from time to time to an amount not exceeding \$200,000, by a majority vote of said corporation present at a meeting or meetings duly called for that purpose. Said shares shall be deemed to be personal property and shall not be issued until the same shall have been paid for in full, in cash, or its equivalent, and shall be transferable only on the books of the company, in such manner as the by-laws of said corporation shall direct. And said corporation shall, at all times, have a lien upon the stock and property of its members invested therein, for all debts due from them to said corporation."

Trade Publications.

D. R. Sperry & Co., Batavia, Ill., have issued a very pretty catalogue calling attention to the Sperry filter press for use in laboratory, pharmaceutical and other purposes in which it is desirable to separate solid parts from liquids. The various parts of the machines and the different sizes are shown in a number of finely executed illustrations. They also manufacture steam kettles, vacuum pans, stills, steam mixers and driers and caldrons.

The Colliau Furnace is illustrated and described in a little pamphlet entitled "None so Good," which has been published and distributed by Byram & Co., Detroit, Mich. In addition to the description and full table of sizes, it also has a number of pages of testimonial letters from prominent stove makers, machinery founders and other concerns who have used the Colliau Furnaces.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, {
New York, March 15, 1899. }

In another column we give the details of the organization of the International Steam Pump Company. This is the steam pump consolidation to which we alluded in this column several weeks ago.

Probably the most interesting feature of the market this week was an inquiry from the American Steel & Wire Company for about 12,000 horse-power of boilers. Bids have been received from the various water tube boiler builders, but the contract has not yet been awarded. The boilers will be placed in various plants controlled by the company, but the greater part, we understand, will go to Cleveland. It is also stated that this company are purchasing machinery and equipping a number of the plants in modern style.

The National Enameled & Stamped Ware Company are also said to be in the market for additional machinery for the re-equipment of various plants which they control. The purchasing, it is stated, is being conducted at the Baltimore office.

A project for the construction of a \$3,000,000 shipyard in Baltimore is quietly but, we understand, surely, coming to definite issue. Henry G. Morse is engineering the deal. Mr. Morse retired from the presidency of the Harlan & Hollingsworth Company of Wilmington, Del., to organize the company. He has visited the shipyards in Europe and this country and accumulated data relative to the most improved methods. The financial details are about completed.

The Cleveland City Forge & Iron Company, whose New York offices are located at 11 Broadway, were awarded the contract for the forged rudder frame for the battle ship "Maine," which is building at Cramps' yards. The forging will weigh about 45,000 pounds. The order for the forged rudder frame for the battle ship "Ohio," which is being built by the Union Iron Works, San Francisco, was also given to the Cleveland City Forge & Iron Company. This piece will weigh about 33,000 pounds.

Westinghouse, Church, Kerr & Co., 26 Cortlandt street have just contracted to build for the Bradford Electric Light Company of Bradford, Pa., two gas engines which will constitute the largest central station gas engine plant in existence. One of the engines is to be of 200 horse-power and the other of 325 horse-power. Natural gas will be used and the plant is to be a central electric lighting station.

Proposals will be received until Wednesday, March 23, at the office of the Department of Correction, 148 East Twentieth street, this city, for a complete high pressure steam plant for the workhouse and a complete pumping outfit for the stone quarry, Blackwell's Island.

M. Sergey Friede, who is president of the M. S. Friede Company, 320 Broadway, will start for San Francisco on Friday of this week. On March 25 he will sail from San Francisco direct to China.

W. A. Stadelman, Eastern manager of the Brown Hoisting & Conveying Machine Company, whose offices are at 26 Cortlandt street, has sailed for Cuba. He will also visit Porto Rico and Mexico.

Watson & Stillman of this city are building a 100-inch hydraulic wheel press for the Ingersoll-Sergeant Drill Company. They are also working on a very large shaft straightener for the Cumberland Steel & Iron Company.

The George V. Cresson Company of Philadelphia and 141 Liberty street, New York, are installing transmission apparatus at the Cleveland Rolling Mill, where a new engine is being installed; also at the new plant of Dillon & Griswold, Sterling, Ill., and at the new paper mill which the New York & Pennsylvania Company are building at Johnstown, Pa. The last named plant is the fourth mill which the New York & Pennsylvania Company have erected at Johnstown. We heard a short time ago that a considerable amount of piping and valves was still to be ordered for this plant. Robert Wetherell & Co. of Chester, Pa., received the order for the engines. There will be 2400 horse-power in four units. McEwen & Co. of Wellsville, N. Y., will furnish a 300 horse-power boiler plant. The pumps have been ordered from the Deane Steam Pump Company of Holyoke, Mass., and the conveying and coal handling machinery will be furnished by the Jeffrey Mfg. Company. The other machinery was divided between Pusey & Jones of Wilmington, Del., the Holyoke Machine Company and E. D. Jones & Sons of Pittsfield, Mass. The General Electric Company will equip the entire plant with electricity.

The Frank M. Pierce Engineering Company of 26 Cortlandt street were awarded the contract for three 300 horse-power Ball vertical cross compound engines by the Navy Department for the Brooklyn Navy Yard.

An inquiry is in the market for an entire forging plant, which will contain a 5000-ton hydraulic forging press. We understand that the intending purchaser is the Russian Government and that the plant is to be shipped and erected in Central Russia. The forge must be capable of handling armor plate and the entire affair is to be electrically driven. One clause in the specifications is that the heaviest piece is not to exceed 35 tons in weight. The Russian Ambassador at Washington is said to have particulars.

The Smith-Vaile-Stillwell-Bierce Company of 141 Broadway have just received an order for \$30,000 worth of water wheels to run the electrical machines to open the lock gates on the Sonlages Canal.

Consul Marshal Halstead of Birmingham wishes to hear from concerns in this country making cold stamped rivets.

Manning, Maxwell & Moore, the well-known manufacturers' agents for a great variety of machine tools, have opened a branch office at 26 South Water street, Cleveland, Ohio, which they have placed in charge of Frank B. Ward. Mr. Ward is well known in the machinery trade, having had a wide experience in connection with other prominent houses in the capacity of manager. He is further well equipped for the business by reason of his practical experience in manufacturing.

Moving from the Naugatuck Valley.

A project is under consideration which possesses a good deal of general interest to the Naugatuck Valley, since it is based upon considerations which throw some light on the economic factors which influence the prosperity of that famous brass and copper region.

G. N. Clowes, managing partner and superintendent of Randolph & Clowes of Waterbury, Conn., has for some time past been investigating the advantages of a Western location over those of the Naugatuck Valley. The high cost of fuel in the latter district is regarded as a serious feature, since coal costs at least \$4 per ton. The fuel cost of manufacturing brass with coal and other fuels at prevailing prices in the Naugatuck Valley figures out about 1 cent per pound of metal shipped. It is estimated that in the Central West this cost could be cut down to one-third.

A further item of cost against the Eastern location is the saving in freight on both copper and spelter, the principal supplies of which come from the West. This, it is estimated, is equal to about 1-6 cent per pound.

These are some of the considerations which have led to Mr. Clowes' investigations and have led him to seriously take up the question of locating, if not the whole plant, then at least a branch of Randolph & Clowes, in some city, like Buffalo, Cleveland, Toledo, Youngstown, Chicago or Pittsburgh, cities from which liberal inducements have been received. Randolph & Clowes' plant at Waterbury now includes a brass rolling mill, a copper rolling mill, a plant for making seamless brass and copper tubes, for making brazed brass and copper tubes, a brass rod mill, a plumbers' supplies factory, works for making seamless drawn copper range boilers and for making brass kettles. A new plant as proposed would occupy about 18 acres of ground, and the pay roll when the works are running full would average \$6000 per week. The ground on which the present works stand in Waterbury has been valued at upward of \$250,000.

The Great Copper Consolidation.

Advice from Boston states that the prospectus of the American Copper Company is in the hands of a printer in that city, and that it will be issued on Wednesday next. It is said to be a most formidable document, with elaborate facts and statements. The capital is placed at \$1,000,000,000, of which \$500,000,000 is to be issued. It is also said that the entire capital is underwritten at 101½, with 1¼ per cent. commission to the underwriters. It states that one-third of the amount has been underwritten by the German house of Rothschild & Co., one-third by J. S. Morgan of London and one-third by American houses. Seven prominent copper companies are named as having been acquired, two of which are foreign companies. It is stated that no company has been or would be included in the combination which did not pay 7 per cent. net.

At Pittsburgh a preliminary order has been made for the sale of the plant of the Pennsylvania Lead Company, at Carnegie, Pa., which went into the hands of receivers nearly three years ago. Geo. S. Griscom, one of the receivers, has been permitted to resign. H. E. Anderson, the other receiver, states that when they took charge of the company's affairs the liabilities were \$1,424,293.28, which were reduced to \$248,000. If the proposed sale goes through the entire indebtedness will be more than wiped out. The plant has not been operated for a year.

The Boston Machinery Market.

Office of *The Iron Age*, 33 Mason Building, {
BOSTON, March 11, 1899.

By far the most important project in the construction line that the month of March has brought to light is the proposition of the Mayor for another subway, which shall parallel the Charles River on the Boston side of the stream, under a magnificent embankment esplanade. The plan involves also the tunneling of Beacon Hill, and proposes to connect with the existing subway at Scollay square, giving a direct route from Harvard Bridge, the principal thoroughfare to Cambridge, beneath the surface to the Northern Union Station. A hearing was given on the subject before the Committee on Metropolitan Affairs of the Legislature, and Mayor Quincy submitted his estimates of the cost as follows: Embankment, without subway, \$500,000; with subway, \$2,775,000; allow 10 per cent. on subway for contingencies, engineering, &c., \$227,500; in round numbers, total about \$3,000,000. The suggestion seems to impress the public favorably, and the Mayor of Cambridge is also an earnest advocate of the plan. Developments will be awaited with interest by the contractors who figured on the present subway, and in case the idea is adopted there will be some heavy contracts for iron and steel to be used in the work.

Bids were opened earlier in the month at the City Engineer's office for constructing two retractile draws for the bridge on Summer street extension over Fort Point channel and the range was from \$28,960 down to \$23,820. The latter was put in by the Berlin Iron Bridge Company of East Berlin, Conn., to whom the award has just been made.

Specifications will be issued soon by the Navy Department for the new dry dock at Portsmouth Navy Yard. It will be almost identical in plan, it is said, with that of the Boston yard, on which bids were received a few weeks ago. Considerable machinery will be wanted in connection with the dock for pumping work and other necessary adjuncts.

Work on the big plant of the New England Gas & Coke Company at Everett has progressed to the point where President Whitney is ready to announce that coke will be on the market May 1. It is stated that Mr. Whitney has secured control of the Otto Hoffman process rights for New York State, and negotiations are under way for the erection of a large plant in Brooklyn, similar to the one in Everett. This would mean that a number of good contracts for structural work and for machinery would be called for, as rumor credits the company with intending to consume upward of 500,000 tons of coal there. The Everett plant will use up 750,000 tons.

From Nashua, N. H., comes the report that the Nashua Iron & Steel Company, who have been for many years recognized as leading factors in the trade in the eastern part of the country, have sold a large slice of their real estate, including the land upon which are located their East and West steel plate mills, the steel mills and some of their furnaces. A local coal company secure the premises, and the steel company will retain and operate their East and West hammer and machine shops and a small tract of land. The competition of Pennsylvania and Southern steel plants has been very hard for the Nashua Company to meet, and this contraction of their business is a natural sequence to the drift of the steel business in this part of the country during the past decade.

Flather & Co. of Nashua are busy on orders sufficient to keep the entire force of about 250 hands actively engaged for the next six months. Among the recent orders was one for a dozen large planers to be shipped abroad.

At the Atlantic Works in East Boston a new compressed air plant, furnished by the George F. Blake Mfg. Company, has been installed at the dock to facilitate the work of making repairs upon vessels. Its first use was this week on the steamer "Admiral Dewey" of the fruit service between this port and the West Indies, which was wrecked in the recent blizzard, and has been brought here for repairs. The outfit includes a compressor weighing about 7 tons, a storage tank with large capacity and resistance and a system of piping for connections with the machines to be employed.

The Metropolitan Water Board have prepared specifications for the contract work to be done in completing the sewerage system for the Clinton district in the vast tract which the board have under supervision. These specifications apply only to excavation and masonry work, but among the latter are named foundations for a pumping station, from which it is to be inferred that further specifications will soon be forthcoming, calling for pumping machinery to be installed there.

Unique among the big bridges of the world will be the drawbridge at Fort Point channel in Boston, which is crossed by tracks of various divisions of the New York, New Haven & Hartford Railroad near the new southern terminal station. The bridge is planned to carry six tracks, and will be a roll lift structure, of massive proportions and weight. Into the frame will enter about 3,000,000 pounds of steel, and the weight of metal on the north

side of the channel will be 4,631,000 pounds, largely composed of girders weighing about 100,000 pounds each. Counterweights will be an important feature of the arrangements for lifting and lowering the draw, their total weight being estimated at 1,700,000 pounds. Power will be obtained through Westinghouse motors, run with electricity supplied from the terminal station power plant. The temporary bridge now in use will be replaced by the new one next fall. The Pennsylvania Steel Company have the contract for the work.

In the Naugatuck Valley.

From Ansonia to Torrington every mill in the Naugatuck Valley is pressed hard with work. Last week the mills were running until 9 and in some cases 10 o'clock at night. The consumption of brass goods is excellent despite the stiff position which both copper and spelter have maintained. Of course the price of brass has been advanced considerably, and even if any of the mills were compelled to purchase their materials at the advanced prices they are now enjoying the benefit of a higher market with a good demand. We understand, however, that the mills were pretty well covered and that even at this time there is no scarcity of metal in the Naugatuck Valley.

The Waterbury Mfg. Company of Waterbury are building a rolling mill to their plant. Heretofore they have been supplied with sheets, &c., by the various large mills. The mill which they are constructing will be of sufficient capacity to supply them with all of the raw material which they require in their manufactures. It is said that the engine which will operate the mill will be of 1200 horse-power.

PERSONAL.

P. W. Gates, president of the Gates Iron Works, Chicago, will shortly take his departure for Europe, expecting to be absent for several months on important business connected with his company.

John W. Gates, chairman of the American Steel & Wire Company, sailed for Europe to-day.

S. T. Wellman of the Wellman-Seaver Engineering Company of Pittsburgh started for Europe last week, to be absent about three months. The company are building an extensive modern plant in England.

Thomas McDonald, formerly connected with the Carnegie Steel Company, and since their organization superintendent of the Ohio Steel Company, has been appointed manager of all the plants of the National Steel Company.

F. E. Drake of Chicago, director of machinery and electricity of the United States Commission to the Paris Exposition of 1900, sailed on Saturday for Paris in company with Charles A. Coolidge, the American architect to the commission, for a conference with the French Commissioners.

J. C. Hazard has been appointed assistant superintendent of the Emaus Furnace, Emaus, Pa.

Benj. H. Taylor has resigned his position as superintendent of the mechanical department of the Edgar Thomson Steel Works, at Bessemer, Pa.

L. C. Phipps, second vice-president of the Carnegie Steel Company, Limited, of Pittsburgh, has gone to Florida for a month's stay.

Thomas Parrock, formerly superintendent of the Union Iron & Steel Company, has been made general manager of the plant of the Ohio Steel Company, now known as the Youngstown Works of the National Steel Company.

L. B. Stillwell has been appointed consulting electrical engineer of the Manhattan Railway Company of New York City. He is now and has been since the inception of the project, about six years ago, in full charge of the electrical plant of the Niagara Falls Power Company at Niagara Falls, N. Y.

James W. Reis has been appointed manager of the New Castle works of the National Steel Company at New Castle, Pa.

The Empire Iron & Steel Company have been incorporated in New Jersey with a capital of \$2,500,000 6 per cent. cumulative preferred stock and \$2,500,000 common stock. We understand that it is an undertaking backed by Rogers, Brown & Co., the well-known pig iron merchants, and Moore & Schley, the bankers, of New York, and that the securities will not be placed on the market. The company propose to lease and operate a number of blast furnaces, having made arrangements for blowing in at once the Valentine Furnace at Bellefonte, Pa., and the Greensboro Furnace at Greensboro, N. C., built in 1892 but never blown in.

The Pennsylvania Steel Company.

The annual meeting of the stockholders of the Pennsylvania Steel Company was held in Philadelphia on the 14th inst. Isaac N. Solis presided. The president's report for year ending December 31, 1898, showed the Steelton plant made a net profit of \$313,912, while the Sparrow's Point plant made a net loss of \$262,893, leaving a net gain of \$51,000. For the year 1897 the Steelton plant's net loss was \$124,650.

In reference to the loss at the Sparrow's Point plant it is stated in the report that the company were only able to work this plant at about one-half its capacity, owing to the war in Cuba and the inability to get ore from that place. About one-fourth of the amount required to keep the plant in operation was received, and in consequence ore had to be obtained from the lake region, which made it more expensive. During 1898 the Sparrow's Point works were placed in first-class order and the shipbuilding plant was started up. The company have several large vessels to build, some being for the United States Government and a few for private corporations.

The prices paid for steel products during the best part of 1898 were low, and there was little profit made. The outlook is thought to be more encouraging and at ruling prices there is a fair profit. It is understood the company have over \$2,000,000 of orders on their books.

The following were elected directors for the ensuing year: Edgar C. Felton, Steelton, Pa.; Luther S. Bent, Overbrook; Estlingham B. Morris, Philadelphia; S. W. Hunnewell, Boston; John Cassels, Washington, D. C.; George Wood, C. Stuart Patterson, Evans R. Dick and William B. Winsor, Philadelphia.

The report of production showed that the output of the Pennsylvania Steel Company of pig iron and spiegel-eisen increased from 85,000 tons in 1896 to 137,000 tons in 1897 and 246,000 tons in 1898. The production of steel ingots rose from 200,000 to 259,000 and 340,000 tons respectively, while that of steel rails developed from 69,000 tons to 110,000 and to 132,000 tons. In 1898 the average price of rails was \$1.92 less than in 1897, while the price of billets and slabs was greater by 66½ cents in 1898 than in 1897.

The Sparrow's Point furnaces made in 1898 138,000 tons of pig iron, and the rolling mills produced 138,000 tons of rails and 10,000 tons of billets and other products.

The Ashland Plant Not Sold.—Somewhat circumstantial and positive reports have been current during the past few days to the effect that the American Steel & Wire Company had purchased the entire plants of the Ashland Steel Company, Incorporated, of Ashland, Ky., and the affiliated concerns the Norton Iron Works at Ashland, the Belfont Iron Works at Ironton and the Kelly Nail & Iron Company, and Sarah Furnace, also at Ironton. We have the assurance of several of the directors of the American Steel & Wire Company that there is no truth in these reports.

The congested condition of the wrought pipe industry is reflected somewhat in the current price of trolley poles used on both sides of a street to sustain the trolley wires. A year ago orders were gladly accepted at 1¼ cents a pound. Now the price is 2¼ to 3 cents. One reason for this other than the normal increase in the price of pipe is that with the big orders in hand for regular pipe the companies do not want to stop to cut pipe to size and accumulate a lot of waste lengths, as is necessary, unless the shorter lengths are made especially, a trolley pole usually having three diameters of pipe, telescoping within each other and swaged at the joints.

The National Tube Works Company, McKeesport, Pa., recently accepted an order direct from a mining company for use at Johannesburg in the Transvaal, South Africa, for about 10 miles of 28-inch steel pipe for conducting water. This will make a shipment of approximately 3500 tons, valued at nearly \$500,000.

Alice Furnace at Sharpsville, Pa., owned by Pickands, Mather & Co., Cleveland, of which C. I. Rader is manager, will blow in this week. This firm are making extensive repairs to their recent purchase, the Ella Furnace at West Middlesex, Pa. Three hundred and ninety horsepower Wheeler boilers are being added, new trestles, coke, ore and limestone pockets and other improvements are being made. The furnace will not be ready for blast before May.

Douglass Furnace at Sharpsville, Pa., owned by the Carnegie Steel Company, Limited, Pittsburgh, is being prepared for blast and will be started in April. The product will be Bessemer iron, which will be shipped to Pittsburgh and used by the Carnegie Steel Company.

THE WEEK.

The number of coke ovens now in blast in the Connellsville region passes all previous records. Out of a total of 18,000, more than 16,000 are active, and it is announced that all the idle ones will be fired up within the next few weeks.

The London Times is authority for the statement that the British naval estimates for the ensuing year will show an increase of nearly \$15,000,000 over the previous year's total, and will reach almost \$140,000,000. It is proposed to add between 4000 and 5000 men to the navy. The largest share of increased expenditure, however, is for shipbuilding and repairs.

The Midland Railway Company of England have ordered ten more locomotives from the Baldwin Locomotive Works, Philadelphia.

The Brazilian Government has accepted the proposal of Great Britain to submit the Guiana boundary dispute to arbitration.

Notwithstanding the advanced rates offered for Lake vessel tonnage, the *Marine Review* of Cleveland, Ohio, says that there are no more boats available now than at the old rate of 60 cents per ton for iron ore, and that journal predicts that rates will go higher.

The first of 50 Brown segmental tube wire guns for the Government was successfully tested at the manufacturers' proving ground, at Birdsboro, Pa., last week. The shots attained a velocity of about 2800 feet per second. The gun tested is a 5-inch and weighs 3¼ tons. Its length is 19 feet. The company have a contract for 25 of these and 25 of the 6-inch. The latter weigh 10 tons and are over 20 feet long. They are to cost \$10,000 each.

A significant feature of the present financial situation in this country is the fact that the banks of Chicago, St. Louis, Cincinnati and other Western cities are buying commercial paper in the East. This is a complete reversal of what has been the normal situation for many years past, the people of the West having been obliged hitherto to rely on the East for their capital.

It is reported from Lancaster, Pa., that the nickel mines in the eastern end of Lancaster County, which have been lying idle for several years, are likely to be operated again this summer. Joseph Wharton of Philadelphia is said to be back of the project.

The State Department at Washington is informed by United States Consul-General Stowe of Cape Town, South Africa, that an act has been passed by the Legislature of Cape Colony providing that all foreign corporations doing business in the colony through a representative must take out a yearly license, for which a tax of 24.33 cents for every \$486.65 of the subscribed capital stock shall be paid.

Consul Ruffin, at Asuncion, Paraguay, appeals to American manufacturers to establish a showroom there, so as to encourage direct shipments of goods from the United States.

Commissioners of the French State Railway have closed a contract with the Baldwin Locomotive Works for the construction of ten large passenger locomotives, to be shipped to France within four months.

A recent transfer of real estate at Newport News, Va., to Collis P. Huntington is stated to be for the purpose of securing a site for the proposed ordnance and armor plate plant at that port. The transfer was made by the Old Dominion Land Company, and included 224 city lots, with a large frontage on the harbor.

As the result of recent interviews between the German Emperor and Cecil Rhodes, the announcement is made that the German Government will guarantee to the Cape Town-Cairo Railway the capital for that portion of the line running through German East Africa.

It is reported that a plan is on foot to unite British oil interests in one combination to work in harmony with the Standard Oil Company for the control of the British, American and Continental oil trade.

The representatives of the railways handling iron out of Pittsburgh, Youngstown, Cleveland and Wheeling met in Cleveland on March 10, and considered a request for a reduction of rates on export shipments. No decision has been reached.

The Bureau of Statistics in its January volume reprints an elaborate report by Mr. Gastrell, English commercial attaché at Berlin, on the development of commercial, industrial, maritime and traffic interests in Germany from 1871 to 1898.

HARDWARE.

Condition of Trade.

THE market continues in an excited state with further advances in many lines. These are caused largely by the advances in the raw material and the difficulty which is experienced in a good many cases of obtaining it. Goods in the production of which labor is the principal cost are not so much affected, but nearly the entire line of Hardware is influenced sympathetically if not directly. It should be borne in mind, however, that manufacturers' quotations are not always to be taken as representing the prices current in the trade, inasmuch as comparatively little business has been done in many cases at the recent advances, a great many goods having been sold before the advances went into effect. The jobbing trade are thus in a position to undersell the manufacturers if they are so disposed. In fact, the prices made by leading jobbing houses to the fair retail trade are in most cases lower than the regularly announced prices of the manufacturers to this class of merchants. This condition of things may be illustrated by the course of the market in Carriage Bolts. It is not long since that these goods were procurable by large buyers at discount 80 and 10 per cent., while at present the prices to this class is discount 70 and 15 per cent., so that the present price is nearly 50 per cent. higher than a short time ago, when large contracts were made on which manufacturers are still working. Under this condition of things it is not surprising that the price made by the jobbing houses to the smaller trade is generally lower than the price at which the jobbers can purchase these goods to-day. A similar condition of things exists in a great many lines, and manufacturers are beginning to realize that they will soon have to compete with their own goods. The rapidity with which prices of Iron and Wire products have advanced and the excitement which characterizes the market are being regarded with some concern by conservative merchants and manufacturers, and the large houses are exercising much reserve in purchasing at the latest advances except to supply their evident requirements. At the same time it should be borne in mind that there is no weakening in price nor letting up of demand and in many lines a scarcity is developing, making it plain that the question in such branches will be not so much the price of the goods as the feasibility of obtaining them at any price.

Chicago.

(By Telegraph.)

Shelf Hardware shows no signs of fatigue, but keeps up the pace very well. Advanced prices, in fact, operate as tonic and seem to make people buy more. A fair business is noted in Tinware, metals and roofing materials, in which values are estimated to be at least 30 per cent. above those prevailing in December. Advances have been made in the general Hardware line on almost everything during the week. Tin Plate is 50 cents per box higher, which will give Tinware another jump before the week is out. Wire Nails have been marked up 15 cents per keg, and all kinds of Wire have likewise been advanced 15 cents per 100 pounds. Jobbers have also advanced their rates on Galvanized Sheets, Sheet

Steel and Corrugated Roofing. The advance on the latter is 30 cents per square. So many articles have been marked up during the week that it would be a serious matter to give the full list. In a general way it may be said that almost everything is from 5 to 10 per cent. higher. The jobbers are awaiting developments with much interest in the formation of a Wire Cloth combination, fearing that they are disposing of their stock at prices which will prove to be much too low. Heavy Hardware jobbers are enjoying an exceedingly large trade, which is not checked by the higher level of values. Collections are reported very good on all sides.

St. Louis.

(By Telegraph.)

Wire Nails and Barb Wire show a pronounced advance of \$3 per ton this week. The buying movement is variously affected thereby, but on the whole satisfactory sales are recorded. Building indications are bright, and while nearly all material, including lumber, entering into house construction shows advanced prices, it is clear that the public can now better afford the greater outlay. Almost every line is drawn on by Hardware dealers, and the higher prices which merchants must pay for new supplies will tone up asking prices for stock they now have on shelves. It is interesting to note through the continued sales of new stock that confidence in the times is firm. Taking the Heavy Hardware lines we find that Singletrees, Trace Chains and kindred Wagon and Harness equipments are stiffening in price and meeting with an encouraging demand. Considering the conditions broadly, advances are met with on every hand and indications point to still higher prices. Orders to jobbers flow in unchecked despite weather or quotations, and buyers' letters indicate an anxiety to get their goods. Merchants are beginning their personal buying visits to this market, and at the same time to show their substantial interest in the projected fair commemorative of the Louisiana purchase.

Boston.

BIGELOW & DOWSE COMPANY.—The present rapid increase in values reminds one of 1863 and 1864, when Cut Nails sold for \$9 per keg and Axes sold for \$20 per dozen. The cause then was inflation. May this present condition not be traced to the same cause? Money is plenty and it is cheap. Before the advance commenced merchandise values were never so low. Cheap money must increase values of merchandise and it is doing so all along the line. Reasonable advances are necessary, and to be expected in the present conditions. The trade expect them and are rejoiced to see the end of the depression. Present conditions are different from any ever before experienced. The market is in the hands of trusts and combinations and it remains to be seen if they will be managed with justice and equity to all. If they have it in their hands to do great good by maintaining a steady market no one should complain of their increasing prices, but if they inflate prices to such a limit that reduced sales will compel them to reduce them again, they will work a great evil.

It seems as if the trade should have some assurance that the advanced prices will be maintained for a certain period under all conditions. With such assurances prices would be maintained and the market would have a solid support to be gained in no other way.

In the New England market dealers are generally taking advantage of increased values and have been

kept busy in keeping track of them. The buyer is reminded of the Fourth of July, when fire crackers are exploding all about him and in the most unexpected places. The Steel Goods Combine came as an almost complete surprise to every one. Merchants are expecting rises in Wire and its products, and an advance of over 50 per cent. is not uninteresting to those with stocks in hand.

The jobbers have been alive to the present situation and have protected themselves, while the retail dealers generally have made no speculative purchases of much account.

The full employment of labor in our mills and general advance in the workmen's wages must help the general trade.

The bad weather has been a drawback, but the warmer sun will bring new life to every one.

The Cycle Trade Company report the number of Bicycle dealers added to their '99 list in the United States and Canada as 5796. The number dropped as 10,003.

The number added in New England as 1104, and those dropped as 1253. These figures and the orders booked indicate the interest that still exists in a country noted for its good roads. It seems fair to presume that the interest in wheeling will not slacken, and that a week of good weather will stimulate a large and healthy trade.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues very active. The fact is the average retail merchant, if he looks back, will find that present existing advances in most cases do not recoup the manufacturers for the prices that existed in 1892. Notwithstanding the advances the average prices are not so high as they have been at various dates during that interim. There is a feeling among many of the retail merchants that the advances, although they do not reach former prices, are too sudden. This, however, was to be looked for, as very few advances had taken place after the time the active movement in Hardware began early last fall, until within the last few weeks.

The trouble is scarcity of leading goods for immediate orders. Shovels, Spades and Scoops are scarce, and all kinds of Agricultural Implements like Garden and Field Hoes and Malleable and Cast Steel Rakes; in fact, in that entire line there is a great scarcity. There has been a great scarcity of Handles. We ourselves have furnished the entire stock of Handles we had on hand, purchased during the season, to handle up some goods we had bought months ago, and which had already been sold. The fact is the retail merchants have bought many of these leading goods earlier than they do ordinary seasons. Manufacturers may recoup themselves later on with stock.

Take the articles of Green Wire Cloth and Poultry Netting. We are informed by some that the product for the season is already oversold, and those retail merchants who do not depend upon the jobber for these goods will probably not have their goods in time for their wants.

Prices are firm, very firm; many goods are scarce, very scarce, and there will naturally be some complaint from the retail trade who do not receive prompt shipments on leading goods, which however, will be unavoidable.

The conditions that exist now have not existed for several years, and we feel the average merchant will wake up to the fact that the present average of prices is likely to exist for some time to come. The conditions of raw material make this inevitable.

San Francisco.

MILLER, SLOSS & SCOTT.—The rapid advance on all lines of Hardware, Iron and Steel has had an influence in creating quite a demand for staple goods, all being anxious to get orders placed at old prices. The advanced prices are well maintained and orders coming in freely; as a consequence stocks are beginning to show the drain.

Trade is very good, considering that the season has been short of rain, which is very much needed and is

looked for every day. So far the country is in good condition, and rain at this time would materially affect all lines.

The export and foreign trade shows quite an improvement. The travel to the Klondike is just commencing, and although there may not be so much of a rush as last year we expect a considerable traffic on a more steady basis than last year.

Collections are fairly good and everything looks to this being as prosperous a year as was last.

Louisville.

W. B. BELKNAP & Co.—The market is still going all one way. Advances are just as certain to come to us in our morning mail as the daily papers at our breakfast table. Of course this means increased production sooner or later, and we hear of the old wheels being cleaned up and greased, and floor plates being relaid. Many atrophied plants, like the desert vegetable growths, are greening up and blooming out afresh under the stimulus of abundant water.

There is undoubtedly a very large consumption. The railroads have not been so free buyers for many years. And it is the era of expansion, not only territorially, but also in the way of stocks. Larger stocks are being carried and new stores being started which require new stocks. But finally, of course, we must depend on the consumer. If he wants all of these goods which are being scrambled for just now all will be well. We hope that he does. And we firmly believe that he is better able to pay for them than for a long time back.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Everything in the line of Hardware, Tin, Metals and Plumbing Goods advancing. We dare not make a price good for 24 hours ahead. Such a market we have not seen since the '70's and '80's. Trade in itself is not what might be desired. There is not the snap and vim that has heretofore been noticeable in such a market as we have to-day. Wheat and wool are being held at somebody's expense, interest accumulating on advances and warehouse charges piling up while prices do not advance. Money has been too easy and consequently speculation has been indulged in. Business is never so good under these circumstances.

Collections are constantly growing worse rather than better. It is a common remark that since '93 at no time have collections been so hard to make.

Notes on Prices.

Wire Nails.—The Wire Nail market continues to have an upward tendency, and since our last report another advance of 15 cents has been made by the American Steel & Wire Company. The volume of business continues large. Manufacturers' quotations are as follows, f.o.b. Pittsburgh or Cleveland:

To jobbers in carload lots.....	\$2.00
To jobbers in less than carload lots.....	2.02½
To retailers in carload lots.....	2.05
To retailers in less than carload lots.....	2.15

Prices are generally quoted by the manufacturers delivered, freight being added to point of destination. The jobbing trade are to a good extent following the advances made by the manufacturers, but in a good many cases they are giving their customers somewhat lower prices.

New York.—The New York Nail market continues to be characterized by an excellent demand and a good many Nails are moving. It is not, in fact, in all cases easy to obtain the goods as fast as called for. In view of the advance of 15 cents per keg referred to above prices are now as follows: Carload lots on dock, New York, \$2.15 to \$2.20; small lots from store, \$2.30 to \$2.35.

Chicago, by Telegraph.—Manufacturers advanced prices 15 cents per keg on the 11th inst., making carload lots, Joliet and De Kalb, \$2.15. The advance was compelled by the continuous upward movement in raw material. A heavy business has been done during the week, and it is not expected that the advance now made will seriously

affect the demand. Jobbers have been having a very good trade, the ruling price being paid cheerfully. They immediately adopted the new advance made by manufacturers, and quote \$2.25 for small lots from stock.

St. Louis, by Telegraph.—The jobbing trade have received an announcement of an advance of \$3 per net ton on Nails. Makers' car lot quotation to jobbers is now \$2.15, St. Louis. Jobbers quote \$2.25 to \$2.30 in small lots from stock. The opening of the building season is near at hand, and Nails will soon pass into consumers' hands. Opinions are had that still higher prices will prevail because of the contraction in supply of raw material.

Pittsburgh.—There has been a further advance of 15 cents a keg in prices by the American Steel & Wire Company, the minimum price to the large trade now being \$2, f.o.b. Pittsburgh or Cleveland. In spite of the recent heavy advances made in Wire Nails, amounting to over \$15 a ton, demand is active and the outlook for spring trade is very encouraging. It is reported that the American Steel & Wire Company are negotiating for the purchase of the plants of the Ashland Steel Company and Norton Iron Works, at Ashland, Ky., and Belfont Iron Works Company, Kelly Nail & Iron Company and Sarah Furnace, at Ironton, Ohio. By securing these plants the American Steel & Wire Company would be in complete control of the Rod, Wire and Wire Nail trades, owning all the large plants, with the single exception of that of the John A. Roebling's Sons Company, in Trenton, N. J. It is stated that the American Steel & Wire Company now own some 41 different works. We quote Wire Nails to large buyers in carload lots at \$2; to large buyers in less than carload lots at \$2.02½; to small buyers in carload lots, \$2.05; to small buyers in less than carload lots, \$2.15, f.o.b. Pittsburgh or Cleveland.

Cut Nails.—The Cut Nail market is decidedly firmer, and manufacturers are generally advancing prices. At this writing the quotation which represents the market is \$1.50 to \$1.60 in carload lots, f.o.b. Pittsburgh, but the former figure, while obtainable, is exceptional, and it is not unlikely that a higher price will soon be substituted. The fact that there is a wider difference than usual between Cut and Wire Nails operates in favor of the former.

New York.—There is a good demand for Nails, the outlook for building being excellent. The New York price for carloads on dock is \$1.65, small lots from store being held at \$1.75.

Chicago, by Telegraph.—Carload lots of Cut Nails could hardly be bought at less than \$1.75 here, but jobbers have not yet advanced to the equivalent price and quote small lots from stock at \$1.65.

St. Louis, by Telegraph.—The week's advance in Wire Nails has had no effect thus far on the Cut Nail market. They will unquestionably respond to the increased building demand and bring rising prices. We quote from store to-day \$1.65.

Pittsburgh.—There is a heavy demand for Cut Nails, and the mills are so filled up with orders that prompt shipments are hard to get. Prices have further advanced, and we quote at \$1.50 to \$1.60 in carload lots, f.o.b. Pittsburgh. We are advised that some mills are holding firm for \$1.60, and in some instances are quoting higher prices.

Barb Wire.—An advance of 15 cents was made by the manufacturers 11th inst. and present quotations are as follows, f.o.b. Pittsburgh or Cleveland:

To Jobbers in carload lots, Painted	\$2.10
" " Galvanized	2.50
To Retailers Painted	2.15
" " Galvanized	2.55
" in less than carload lots, Painted	2.25
" " " Galvanized	2.65

There continues to be a heavy demand and complaint is made of difficulty in obtaining Wire.

New York.—The demand for Barb Wire is fair and with the advance of the season is expected to quicken. Carload lots of Four-Point Galvanized on dock are quoted at \$2.65 and small lots from store at \$2.75. Painted Wire is 40 cents less.

Chicago, by Telegraph.—A heavy trade is reported in all kinds of Wire both by manufacturers and jobbers. An

advance of 15 cents per 100 pounds was made on the 11th and carload lots of Joliet Painted Wire are now quoted at \$2.25, with Galvanized at \$2.65 and Smooth Annealed at \$2, base. Jobbers have advanced their rates to correspond and quote small lots from stock at 10 cents above these prices.

St. Louis, by Telegraph.—Fifteen cents advance per 100 pounds has been made by mills. The carload price to jobbers is \$2.25 on Painted, f.o.b. St. Louis. On single cars dealers quote \$2.30, and \$2.40 for smaller lots from stock. The spread on Galvanized is 40 cents per 100 pounds.

Pittsburgh.—Prices have been advanced \$3 a ton all around. There is a heavy demand for Barb Wire and the volume of spring business promises to be very large. The American Steel & Wire Company are pursuing the policy of quoting only for immediate acceptance. We quote to large buyers in carload lots: Painted, \$2.10; Galvanized, \$2.50. To small buyers in carload lots: Painted, \$2.15; Galvanized, \$2.55. To small buyers in less than carload lots: Painted, \$2.25; Galvanized, \$2.65, f.o.b. Pittsburgh or Cleveland.

Smooth Wire.—Smooth Wire continues to move very freely, shipments being limited by the capacity of the mills. It is anticipated that something of a shortage may be experienced. An advance of 15 cents per 100 pounds has been made by the manufacturers since our last issue, and the market is now represented by the quotation of \$1.85, base, for the Plain, f.o.b. Pittsburgh or Cleveland, with 40 cents additional for Galvanized. To single carload buyers the price is \$1.90, base, for the Plain in carload lots and \$2 for less than carloads, f.o.b. Pittsburgh or Cleveland, an advance of 40 cents being made for Galvanized.

Pittsburgh.—Demand is heavy, the advances in prices made by the American Steel & Wire Company causing buyers to place orders liberally, in anticipation of still higher prices. There has been another advance of \$3 a ton and we now quote at \$1.85, base, with 40 cents advance for Galvanized. To single carload buyers the price is \$1.90, base, and for less than carload lots \$2. An advance of 40 cents is made for Galvanized, all f.o.b. Pittsburgh or Cleveland.

Wrought Iron Pipe.—The market for Wrought Iron Pipe continues very strong in tone, with a very large volume of business. Another advance was made on Monday, present quotations being discount 60 per cent., with five 10's and 5 extra for carload lots, less than carload lots being quoted at discount 60 and five 10's. Casing is quoted as follows:

	Discount.
	Per cent
Screw Socket Joint.....	52½ and 10
Inserted Joint.....	52½

Hollow Ware.—A further advance has been made by the manufacturers of Cast Iron Hollow Ware and quotations are about 10 per cent. higher than those recently prevailing.

Tacks.—The Tack market continues firm and several moderate advances have been made by the manufacturers. This is made necessary in view of the increased cost of material. There is also a good deal of complaint of difficulty in obtaining all the Tack Plate required. This is especially so in the West. Few of the manufacturers have any considerable stock of goods on hand, and all refer to the heavy volume of business. In this condition of things several of the manufacturers are withdrawing quotations and those made are only for immediate acceptance and subject to change without notice.

Goods Made from Wire.—In view of the condition of the Wire market and the difficulty, in fact, of obtaining an adequate supply of Wire, quotations on nearly all goods into which Wire enters as an important material are notably higher and characterized by a firm tone. Manufacturers also are conservative in making quotations, prices named being only for immediate acceptance. These remarks apply to a large variety of goods, such as Sifters, Sieves, Riddles, Sand Screens, many kinds of Mouse and Rat Traps, Corn Poppers, Fly Traps, Wire Clothes Line, Wire Muzzles and Window Guards and Wire Work in

Champion Four Tine Manure Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
19.	Oval, 4 Tine, I. D. Handle, Plain Ferrule.....	\$13.50
20.	" " " " Strap "	15.00
21.	" " " " W. D. " Plain "	14.00
22.	" " " " " " Strap "	15.50
23.	" " " " Long " Plain "	12.50
24.	" " " " " " Strap "	14.00

Oneida Four Tine Manure Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
25.	Oval, 4 Tine, D Handle, Plain Ferrule.....	\$12.00
26.	" " " " Strap "	13.50
27.	" " " " Long " Plain "	11.00
28.	" " " " " " Strap "	12.50

Five Tine Manure Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
29.	Oval, 5 Tine, D Handle, Plain Ferrule.....	\$19.00
30.	" " " " Strap "	20.50
31.	" " " " Long " Plain "	18.00
32.	" " " " " " Strap "	19.50

Six Tine Manure Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
33.	Oval, 6 Tine, D Handle, Plain Ferrule.....	\$22.00
34.	" " " " Strap "	23.50
35.	" " " " Long " Plain "	21.00
36.	" " " " " " Strap "	22.50

Wood D Handles furnished, if so ordered, at same list.

Washington Four Tine Manure Forks

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
37.	Oval, 4 Tine, D Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	\$10.00
38.	Oval, 4 Tine, D Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	11.50
39.	Oval, 4 Tine, Long Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	9.00
40.	Oval, 4 Tine, Long Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	10.50

Five Tine Manure Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
41.	Oval, 5 Tine, D Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	\$16.50
42.	Oval, 5 Tine, D Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	18.00
43.	Oval, 5 Tine, Long Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	15.50
44.	Oval, 5 Tine, Long Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	17.00

Six Tine Manure Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
45.	Oval, 6 Tine, D Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	\$17.50
46.	Oval, 6 Tine, D Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	19.00
47.	Oval, 6 Tine, Long Handle, Plain Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	16.50
48.	Oval, 6 Tine, Long Handle, Strap Ferrule, Half Polish, 11 $\frac{1}{2}$ -inch Tine.....	18.00

Wood D Handles furnished, if so ordered, at same list.

Excelsior Four and Five Tine Spading Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
49.	4 Tine, Diamond Back, I. D. Handle, Plain Ferrule.....	\$18.00
50.	" " " " " " Strap "	19.50
51.	" " " " W. D. " Plain "	18.50
52.	" " " " " " Strap "	20.00
53.	" " " " Long " Plain "	17.00
54.	" " " " " " Strap "	18.50
55.	" " Flat " I. D. " Plain "	17.00
56.	" " " " " " Strap "	18.50
57.	" " " " W. D. " Plain "	17.50
58.	" " " " " " Strap "	19.00
59.	" " " " Long " Plain "	16.00
60.	" " " " " " Strap "	17.50
61.	5 " Diamond " I. D. " Plain "	24.00
62.	" " " " " " Strap "	25.50
63.	" " " " W. D. " Plain "	24.50
64.	" " " " " " Strap "	26.00
65.	" " " " Long " Plain "	23.00
66.	" " " " " " Strap "	24.50

Washington Spading Forks.

Solid Steel Shanks. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
79.	4 Tine, Diamond Back, Mall. D. Handle, Plain Ferrule.....	\$16.00
80.	" " " " " " Strap "	17.50
81.	" " " " Long " Plain "	15.00
82.	" " " " " " Strap "	16.50

Wood D Handles furnished, if so ordered, at same list.

Oneida Four Tine Spading Forks.

Solid Steel Shank. Blue Finish, with Patent Capped Ferrules.		Per dozen.
No.		
67.	4 Tine, Diamond Back, I. D. Handle, Plain Ferrule.....	\$17.00
68.	" " " " " " Strap "	18.50
69.	" " " " W. D. " Plain "	17.50
70.	" " " " " " Strap "	19.00
71.	" " " " Long " Plain "	16.00
72.	" " " " " " Strap "	17.50
73.	" " Flat " I. D. " Plain "	16.00
74.	" " " " " " Strap "	17.50
75.	" " " " W. D. " Plain "	16.50
76.	" " " " " " Strap "	18.00
77.	" " " " Long " Plain "	15.00
78.	" " " " " " Strap "	16.50

Excelsior Four Tine Straw and Header Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
83.	Oval, 4 Tine, 12 inch, Bent Handle, Plain Ferrule.....	\$12.50
84.	" " " " " " Strap "	14.00
85.	" " " " 13 inch, " Plain "	13.25
86.	" " " " " " Strap "	14.75
87.	" " " " 14 inch, " Plain "	14.25
88.	" " " " " " Strap "	15.75
89.	" " " " 15 inch, " Plain "	15.50
90.	" " " " " " Strap "	17.00
91.	" " " " 16 inch, " Plain "	17.00
92.	" " " " " " Strap "	18.50

Handles over 5 feet in length,	
Advance for 5 $\frac{1}{2}$ feet.....	.25
" " 6 " .....	.50

Four Tine Barley Forks

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
93.	Oval, 18 inch, 4 Tine, Bent Handle, with Bail, Plain Ferrule.....	\$22.50
94.	Oval, 18 inch, 4 Tine, Bent Handle, with Bail, Strap Ferrule.....	24.00
95.	Oval, 20 inch, 4 Tine, Bent Handle, with Bail, Plain Ferrule.....	25.00
96.	Oval, 20 inch, 4 Tine, Bent Handle, with Bail, Strap Ferrule.....	26.50
Extra for 6 $\frac{1}{2}$ and 7 feet Handles, per foot.....		.75

Champion Four Tine Hay Forks

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
97.	Oval, 4 Tine, 12 inch, Bent Handle, Plain Ferrule.....	\$12.50
98.	" " " " " " Strap "	14.00
Extra for 5 $\frac{1}{2}$ and 6 feet Handles, per foot.....		.50

Excelsior Three Tine Hay and Straw Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
99.	Oval, 3 Tine, Plain Ferrule.....	\$9.00
100.	" " " " Strap "	10.50
101.	" " " " Plain " Bent Handles.....	9.50
102.	" " " " Strap " " "	11.00
Handles over 5 feet in length,		
Advance for 5 $\frac{1}{2}$ feet.....		.25
" " 6 " .....		.50

Three Tine Hay, Straw and Barley Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
103.	Oval, 3 Tine, 13-inch, Plain Ferrules.....	\$9.50
104.	" " " " " " Strap "	11.00
105.	" " " " " " Plain " Bent Handles.....	10.00
106.	" " " " " " Strap " " "	11.50
107.	" " " " 14-inch, Plain "	10.25
108.	" " " " " " Strap "	11.75
109.	" " " " " " Plain " Bent Handles.....	10.75
110.	" " " " " " Strap " " "	12.25
111.	" " " " 15-inch, Plain "	11.25
112.	" " " " " " Strap "	12.75
113.	" " " " " " Plain " Bent Handles.....	11.75
114.	" " " " " " Strap " " "	13.25
115.	" " " " 16-inch, Plain "	12.50
116.	" " " " " " Strap "	14.00
117.	" " " " " " Plain " Bent Handles.....	13.00
118.	" " " " " " Strap " " "	14.50

Handles over 5 feet in length,	
Advance for 5 $\frac{1}{2}$ feet.....	.25
" " 6 " .....	.50
For Riveting, add to list, per dozen.....	.50

Excelsior Two Tine Hay and Straw Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
119.	Oval, 2 Tine, 12-inch, Plain Ferrule.....	\$7.50
120.	" " " " " " Strap "	9.00
121.	" " " " " " Bent Handle, Plain Ferrule.....	8.00
122.	" " " " " " Strap "	9.50
Extra for 5 $\frac{1}{2}$ and 6 feet Handles, per foot.....		.50

Two Tine Boy or "Tedding" Forks.

Solid Steel Shanks. Gold Bronze Finish, with Patent Capped Ferrules.		Per dozen.
No.		
123.	Oval, 2-Tine, 8 $\frac{1}{4}$ -inch Tine, 4 feet Handle, Plain Ferrule.....	\$6.00
124.	Oval, 2-Tine, 10 to 10 $\frac{1}{4}$ inch Tine, 4 feet Handle, Plain Ferrule.....	6.50
Handles above 4 feet long, extra for each 6 inch.....		.25
Extra for riveting or nailing Punched Shanks in Forks.....		.50

New England Hardware Dealers' Association.

THE regular monthly meeting of the New England Hardware Dealers' Association was held at the United States Hotel, Boston, Wednesday, March 8. Dinner was served at 6 o'clock and a business meeting followed. First Vice-President William D. Parlin presided, later giving way to Third Vice-President J. H. Sayward, who occupied the chair throughout the remainder of the evening. George H. Mulhall, for the committee, reported appropriate resolutions on the death of John C. Holden of Hudson, Mass., which were adopted. The secretary read the declination of J. Carleton Nichols, who at the last meeting was elected president for the ensuing year. Mr. Nichols' declination was accepted and H. G. Janvrin, chairman of the Nominating Committee, reported the name of William D. Parlin of Natick to fill the vacancy. Mr. Parlin was unanimously elected president, and the second and third vice-presidents were advanced to first and second respectively, and E. M. Richardson of Waltham elected third vice-president, so that officers for the ensuing year are as follows:

President, William D. Parlin, Natick.

First Vice-President, Bion C. Pierce, Taunton.

Second Vice-President, John H. Sayward, Haverhill.

Third Vice-President, E. M. Richardson, Waltham.

Pricing Committee:

M. A. Chandler, Boston.

J. B. Hunter, Boston.

J. C. Nichols, South Boston.

W. H. Billings, Dorchester.

W. E. Plummer, Somerville.

Investigating Committee:

E. C. W. Bliss, Boston.

H. M. Sanders, Boston.

M. H. Tarbox, Boston.

Membership Committee:

H. G. Janvrin, Boston.

J. H. Sayward, Haverhill.

M. H. Tarbox, Boston.

The following new members were elected:

E. O. Noyes, Brockton.

Joseph H. Hanks, South Boston.

George W. Campbell, Boston.

As previously announced, the subjects for discussion were:

Is it advisable to continue as a social organization? If not, what can you suggest to make it a business organization?

Would it be advisable to have an associate membership of out of town dealers at a minimum cost?

The first question was taken up, and debated in an interesting way, and it is probable that this meeting of the association will turn out to be the most profitable in its history. Certainly, if the suggestions made are properly formulated and enthusiastically carried out it will mark a new departure in New England Hardware trade organizations. The debate was listened to with great attention, and although no vote was taken it was evident that the central idea of Edward A. Loomis' remarks met with great favor.

Mr. Loomis' Address.

Ex-President Loomis, in an address full of admirable suggestions pertaining to the subject under discussion, presented outlines of a plan to make the organization of more practical value in a business way. Without depreciating the social features, and advocating their continuance, he recommended that active efforts be made to form local organizations, beginning in towns where there are already one or more members, who should become missionaries, so to speak, and endeavor to induce their fellow merchants to join them in conferences which would be likely to develop into strong local organizations; these bodies to be a part of the central organization and report thereto. One of the greatest difficulties encountered by

the Pricing Committee has been the practical impossibility of formulating schedules on staple articles which should be equally acceptable to merchants in Boston and those in the smaller towns and cities lying outside of the metropolis. It appeared to be Mr. Loomis' idea to have the local organizations make their own prices, simply agreeing among themselves and reporting such agreement to the parent organization, so that each locality, by interchange of views and prices, should become a part of the greater unit, coming up to the level of the highest commercial standards.

He cautioned his hearers that such a condition could not be brought about without a great deal of patient and tactful work, but believed that it was entirely feasible, and cited in proof of this view the workings of the Providence Nail Association, which has for the past 15 years controlled the price of Nails in Providence, and has recently joined with the dealers of Pawtucket, a neighboring city, so that to-day the market price for Hardware staples, so called, in the State of Rhode Island is practically uniform. By this means each locality is reasonably sure of obtaining its proportionate share of the general trade, and the entire business is done at a fair profit.

Mr. Janvrin's Views.

Mr. Hiram G. Janvrin of Boston indorsed the views of Mr. Loomis and said that the New England Hardware Dealers' Association had been a great success as a social organization, but was a comparative failure as a business body, and he hoped a change might be brought about so that its members might receive more substantial benefit, and he thought the plan proposed would result in a strong local organization in Boston. At the present time many dealers in that city are independent and no one is making as much profit as could be legitimately demanded.

Remarks of Mr. Adams.

Charles E. Adams of Lowell, a prominent Hardware merchant, also president of the Massachusetts State Board of Trade, thought it time for the Hardware dealers to make a little money. He said that a movement had been inaugurated in his city to form a local organization to regulate the price of Nails, Screws, &c., which are now being sold at a price which does not result in any profit at all. As a man of many years' experience with trade associations Mr. Adams is competent to speak on their workings. He highly recommended the proposed change in the character and methods of the New England Hardware Dealers' Association and believed that it was easily possible to accomplish all that was desired.

Lowest Price the Basis for Agreement.

In response to a question, Mr. Loomis spoke again, advising a spirit of compromise and suggesting that one dealer should not go to another with his mind made up and determined to insist upon his own price being the basis of the agreement, but rather, if it is found impossible to persuade the dealer who is selling at the lowest price to advance his figures, agree with him, thus making the lowest price the basis on which to form a local association. He said it would usually be found that the dealer who insisted upon a ruinously low price would, when he found that every one in the town was selling at the same price, soon come to the conclusion that it would be better for all to advance and would often be the first to make the suggestion. The main thing is to agree, and in ultimate results it is often better to found the agreement upon an unprofitable price, although this will not be necessary in many cases.

Secretary Farless' Remarks.

Secretary James A. Farless read a letter from the western part of Massachusetts, written by an observing traveling man, which referred to the workings of several local associations on his route, and expressed the opinion that the membership and usefulness of the New England Hardware Dealers' Association might be greatly increased if proper efforts were made to introduce it to dealers generally. Mr. Farless then addressed the members, urging

more individual work for the general good, and calling attention to the fact that as a business organization the association had accomplished practically nothing. What little work that had been put into it by members had been given chiefly to the social features. He urged more activity and a larger expenditure of money.

No Action Taken.

At the close of Mr. Farless' address the meeting adjourned without taking a vote, and the second question was left for discussion at another meeting. The hour was late, and as it is desired to have other expressions on the subject from the membership it was deemed better to carry both subjects over.

New England Iron and Hardware Association.

THE annual dinner of the New England Iron & Hardware Association, which is to be held at Young's Hotel, Boston, March 21, promises to bring together a representative company of Hardware and metal dealers. Among the invited guests will be Gov. Roger Wolcott; Col. H. A. Thomas, postmaster of Boston; Rev. E. A. Horton; Hon. Patrick A. Collins, former United States Consul-General at London; Josiah Quincy, Mayor of Boston; H. H. Bishop, president of the National Hardware Association; T. J. Fernley, secretary of same; William D. Parlin, president of New England Hardware Dealers' Association; Henry Pearson of the Western New England Iron & Hardware Association; C. E. Adams, president of Massachusetts State Board of Trade, and Robert A. Bolt, president of Boston Associate Board of Trade. Many of the members have invited guests from out of town and New York and Philadelphia are expected to be well represented. The dinner will be given at 6 p.m., preceded by a reception at 5.30.

Meeting of Wire Cloth Manufacturers.

A MEETING of the Wire Cloth Manufacturers' Association was held last week at the Iroquois Hotel, Buffalo, to revise and unify the price-lists of the different manufacturers of Wire Cloth, and also to adopt a standard gauge of Wire used in Iron and Brass Cloth.

There was a full attendance, the manufacturers as far away as the Pacific Coast being present.

Charles Swinscoe, manager of the Clinton Wire Cloth Company, was elected president, and Hugh O'Connor, secretary of the Michigan Iron & Wire Works, was made secretary.

It will be remembered that the association in a convention held in 1872 got out the first general price-list of Wire Cloth, covering all grades of Iron, Steel, Brass and Copper Wire Cloth from the coarsest up to 200-mesh. For various reasons some of the newer concerns have departed from this list, which has created more or less annoyance to buyers.

It was deemed necessary to compare all price-lists and correct all discrepancies. A committee was appointed to do this, and the work occupied two days. When the revised list was presented to the association it was unanimously adopted.

The Wire gauges to be used in quoting are as follows:

For Iron Wire, Washburn & Moen Mfg. Company's gauge; for Brass Wire, the old English gauge.

A large amount of general business was transacted, and a final conclusion in all matters was reached without a dissenting voice, which was exceedingly gratifying to all concerned.

Scheeler's Sons, Buffalo, extended invitations to the members of the association to visit many points of interest, including among others the Niagara power house, in which were found ten dynamos 5000 horse-power each driven by water wheels 140 feet below the dynamos, the peripheries of the latter traveling considerably over 1 mile a minute. These are driven by an 11-inch vertical shaft. As an example of mechanical engineering this plant

stands as one of the wonders of this century, for so nicely are the vertical shafts balanced that the most sensitive touch could not discover any vibration when moving at full speed. The meeting adjourned to meet the second Tuesday in August next at Atlantic City, N. J.

Requests for Catalogues, Quotations, &c.

CARLTON HARDWARE COMPANY, Calumet, Mich., with branch stores at Red Jacket and Houghton, are opening another branch at Rockland, where they will carry a full line of Shelf and Heavy Hardware, Mining and Mill Supplies and House Furnishing Goods. The company will be pleased to have catalogues from manufacturers and jobbers sent to their Rockland store.

On March 1 the Hall-Collins Hardware Company succeeded to the retail department of the Kilbourne-Jones Company, one of the oldest Hardware stores in Central Ohio. The Hall-Collins Company will do a general Hardware business, carrying a full line of Builders' and Cabinet Hardware, fine Tools and Cutlery, Paints, Oils and Varnishes and Mill Supplies. They are desirous of receiving manufacturers' latest catalogues and price-lists.

Swank Hardware Company, Johnstown, Pa., are going to erect in the near future a modern five-story building, with a frontage of 120 feet, to replace the temporary one which they have occupied since the flood of 1889, and are desirous of receiving illustrated catalogues and price-lists of the newest and most approved store and office furniture, fixtures and appliances. They are intending to make their new establishment one of the most convenient and thoroughly equipped in the country.

In a paragraph in our last issue inviting the trade to send circulars, quotations, &c., the address of E. E. Gard was incorrectly given as Fremont City, Ohio. The trade will please note that Mr. Gard is to be addressed instead at Tremont City. He is a dealer in grain, feed, lumber, coal, &c., and expects to put in a line of Hardware April 1.

Root's Price Cards.

A REDUCTION in the prices of Root's Handy Cloth Bound Price Cards,* published by T. W. Root Publishing Company, Detroit, Mich., has been announced. The new list prices are given below. In lots of 20 cards assorted a discount of 20 per cent. is made and express charges are prepaid:

Numbers.....	1	2	3	4	5	6	7
Each.....	\$0.30	.20	.20	.30	.20	.20	.20
Numbers.....	8	9	10	11	12	13	14
Each.....	\$0.20	.20	.20	.30	.20	.20	.20
Numbers.....	15	16	17	18	19	20	21
Each.....	\$0.30	.20	.30	.20	.20	.20	.20
Numbers.....	22	23	24	25	26	27	28
Each.....	\$0.20	.20	.20	.30	.30	.30	.30
Numbers.....	29	30	31	32	33	34	35
Each.....	\$0.30	.30	.30	.15	.08	.20	.20
Numbers.....	36	37	38	39	40	41	42
Each.....	\$0.20	.30	.30	.20	.20	.15	.20
							43
							.50

We are advised by the Root Publishing Company that the demand for these cards from the Hardware trade is such as to justify their publication in a larger edition and at the lower prices named above.

The seventieth birthday of H. J. Green, a veteran Hardwareman of Attica, Ind., was celebrated by an informal dinner on the 23d ult., at the home of his son, La Monte M. Green, who is now conducting the business established by his father. The occasion was a most enjoyable one. Mr. Green embarked in the Hardware business at Attica in 1852, and was succeeded by his son in 1885, since which time he has devoted his attention principally to the management of a large banking institution and other interests, although he still keeps in sympathetic touch with Hardware matters.

* For sale by David Williams Company, 232-238 William St., New York.

The Views of Manufacturers.

MANUFACTURERS in almost every line are experiencing a heavy demand for goods. This is especially so in the heavy lines and in those into which Wire enters as a material. There is, however, a disposition on the part of the trade to purchase general Hardware freely, recognizing the upward trend of the market. Some of the manufacturers, alluding to the present situation, while admitting the desirability of a vigorous demand and their gratification at the improved tone of the market, express some apprehension that perhaps things are moving too rapidly and that the trade are being carried off their feet by the upward movement and the disposition to purchase speculatively. As representing the views of prominent and conservative manufacturers the following extracts from letters will be of interest, touching as they do upon the character of the demand, the disposition of the trade and especially the consolidations which are so prominent a feature in the business situation:

A Manufacturer's View of Consolidations.

There seems to be a tendency toward higher prices in all lines of manufactured goods. We receive daily notices of advances in prices and withdrawal of quotations on all manner of supplies used in our business, and it would seem that in a very short time we, ourselves, will be obliged to change prices in order to cover the increased cost of manufacture. For many months our business has been crowding us, so that at the present time our stock is very much run down, and we are not able to fill our orders as promptly as we did six months ago. We have increased our facilities considerably for turning out our line of goods, and are running our factory overtime, which enables us to fill orders within a very few days; and are not holding any orders back longer than ten days. The outlook as near as we can size it up, judging from the condition of the iron market generally is that business in our line will continue good for at least the balance of this year.

We are watching with considerable interest the effect of the numerous large consolidations, and confess that we do not take an optimistic view of the future situation.

We believe that consolidation in many lines of business is a necessity. We also believe that the manner of the consolidation of most of the large combinations is unsound. Old and worn out plants have been purchased by the consolidated companies at large cash figures. It may be possible for a time to advance prices to such an extent that these old concerns can for a certain period contribute their quota to the income of the consolidation, but for a period of inaction or financial depression such concerns will not be able to add to the profits, but will be a drain on the parent company.

If the manufacturing establishments who desire to form a consolidation would dispense with the services of the speculating promoter, and would combine their interests on a fair inventory valuation they would undoubtedly gradually strengthen their position, and would be able to make profits at reduced prices owing to the great saving in the selling expenses. It is very hard to believe that the combination of three dead ducks can possibly make a vigorous eagle.

From a New England Manufacturer.

Regarding the condition of the market and outlook for business all materials which enter into our goods are, we believe, abnormally high. The jobbing trade are buying, we believe, in excess of their present needs, and while we are from five to six weeks behind our orders, we do not feel in the least sure that before the end of the year has come we will be just as anxious as ever for business; that is to say, notwithstanding the undoubted increase in the actual consumption of goods, it is our opinion that now that the factories have gotten steam up they are already making goods in excess of the consumption, and in a short time merchants will not experience the present difficulty in getting goods. When this time arrives the change will set in. All classes of dealers will be reasonably well supplied with goods. The manufacturers will not care to accumulate a stock with the present prices on material, and the present rate of production will probably have to be curtailed. The consequent decreased demand will very soon have its influence on the producers of Steel, and we believe prices will begin to sag until the lower normal level is again reached.

This view of the matter, we are aware, is quite contrary to that held by the majority of observers, and we dislike to do or say anything to interrupt their pleasant dreams. However, this is the way we feel about it.

From a Pennsylvania Manufacturer.

As to the business conditions, the only danger clouds we now see are labeled SPECULATION. The capacity for consumption is greater than ever before, and the stimulus of advancing prices always brings quick buyers. The advances will cut down the export demand, and will hasten the revulsion which will follow close upon the present excitement.

It is, to a great extent, the export demand that has relieved us from the recent depression. This export business is as yet too tender a plant to be roughly treated. It may be quickly frosted, but a new crop must then be raised from the seed, and it will again take much patience to wait for blossoms.

The manufacturers of the United States cannot afford to spoil the handsome export credit balance shown last year. Combinations to maintain fair profits are beneficial, but when they attempt to smother reasonable competition and to bolster prices unduly up they will soon tumble to pieces, and woe to all who fail to stand from under. Let us not try to get rich too quickly.

Sportsmen's Show.

THE management of the Sportsmen's Show are being warmly congratulated on the success of the exhibition just closed, especially as it was a radical departure in conception from any of its predecessors. The managers are gratified that their efforts have been successful, and extend to the exhibitors and others their congratulations on the results to which they contributed so much. On behalf of the National Sportsmen's Association it is announced that the sixth annual Sportsmen's Show will be given in the Madison Square Garden, New York, March 1, 1900, and the co-operation of all who participated in the exhibition just closed is cordially invited.

Any who contemplate taking space next year the managers will be pleased to hear from at an early date, as space will be rapidly taken up by special features now being arranged for, and space allotted to trade exhibits will be undoubtedly more limited than at the show just concluded.

Price-Lists, Circulars, &c.

HARTLEY & GRAHAM, 313 and 315 Broadway, New York: Bicycle Sundries and Supplies and Golf Goods.

RELAY MFG. COMPANY, Reading, Pa.: Relay Bicycles \$60 to \$30 list.

ROMER AXE COMPANY, Dunkirk, N. Y.: Single and Double Bitted Axes, Boys' Axes, Hunters' and Sportsmen's Hatchets, &c., and Romer's Saw Gummer.

WHITE MOUNTAIN FREEZER COMPANY, Nashua, N. H.: Neatly illustrated blotter calling attention to their improved White Mountain Freezer.

THE U. S. WIND ENGINE & PUMP COMPANY, Batavia, Ill.: Catalogue of Hand and Wind Mill Pumps, Pump Supplies, Well Tools, Tanks, Hose, &c. The company also manufacture the Halladay Standard Wind Mills, Gem Steel Wind Engines and other Wind Mills, a full line of Feed Mills, Horse Powers, Corn Shellers, &c.

WILLIAM T. WOOD & CO., Arlington, Mass.: Circular showing their line of Ice Tools for summer use, for the house and the iceman. Some of the articles illustrated include Ice Axes, Hand Tongs, Shavers, Scales and Hooks.

Trade Items.

CHAS. X. CORDIER, 253 Broadway, New York, who is widely known to the trade, has taken the general agency for the Monarch Engine Stop and Automatic Speed Limit, made by the Monarch Mfg. Company, Waterbury, Conn. A recently issued catalogue of the company gives full description of this device for the stopping of steam engines and other motors and contains a number of testimonials from prominent manufacturers who are using the appliance. Mr. Cordier will have the best wishes of his many friends in this new departure.

THE COLWELL HARDWARE COMPANY, Mansfield, Ohio, have made a number of improvements in their establishment. The shelving now runs to the ceiling and access is secured by means of trolley ladders. New and up to date show cases and other fixtures are also a feature of the store. The third floor of the building has been added to their retail department, which gives the company three floors, each 20 x 98 feet, for retailing purposes. Their line comprises general and Builders' Hardware, Paints, Oils, Glass and Varnish, Sporting Goods, &c.

W. H. BENNETT, manager of the Reading Hardware Company, 105 Lake Street, Chicago, has been favoring his

customers with very artistic souvenirs which call attention to the specially fine finish which the company give their Builders' Hardware. Among these are Pin Trays, some of which represent Horseshoes, and others a bat with outspread wings. An artistic Letter Clip also shows a Vassar girl's head, thus calling attention to the company's Vassar Locks. These souvenirs are finished in copper and gold bronze and in silver.

An advertisement in this issue calls attention to Oatman's Handy Hoops for Tubs, Pails and Barrels, and to Oatman's Adjustable Wrought Steel and Medina Eave Trough Hangers. These goods are manufactured by Oatman Bros., Medina, Ohio.

S. F. MYERS COMPANY, 48-50 Maiden lane, New York, are closing out the balance of a stock of fine Files branded Gold Medal, made some time ago by Hayes, Mayer & Co., Tacony, Pa. S. F. Myers Company were the sole agents, and now have the remainder of the stock, amounting to about 3000 dozens in various numbers of Hand, Pillar, Barrette, Taper flat, Knife, single, half round and cross-ing.

Among the Hardware Trade.

Cutright Bros. have lately opened up a Hardware store, at Huttenville, W. Va.

The firm of A. S. Thomas & Son, Gilboa, N. Y., were dissolved by mutual consent on the 1st inst., Mr. Thomas retiring after a business career at the same stand for 25 years. Frank R. Thomas will continue the business.

William A. Mason has bought the stock and fixtures of George A. Bailey, Belfast, Maine, dealer in Hardware, Iron and Steel, Paints and Oils, Carriage Woodwork, &c.

Wickwire & Russell, Deposit, N. Y., are intending to retire from the Hardware, Stove and Implement business, and the store and stock are for sale.

T. H. Clayton Hardware Company, Denver, Col., have opened a new store with large stock of Builders' Hardware, House Furnishing Goods and Mining Supplies, at Goldfield, in the Cripple Creek district.

Joseph H. Belcher has sold out his Hardware business, at Providence, R. I., to Chas. H. Smith, who has been in his employ for the past seven years.

C. F. Smith & Co., Fall River, Mass., have remodeled their store.

Farrar & Ballinger, London, Ohio, have dissolved partnership and C. W. Farrar is conducting the business under his own name.

H. E. Moon has succeeded French & Moon, at Cassopolis, Mich. Mr. French has been for 37 years continuously in the Hardware business at that point.

Finn, Fowlkes, Williams & Co., Groesbeck, Texas, have dissolved partnership and Williams & Pringle have succeeded to the business.

Thomas Conley and James Hanner have formed a partnership, at Rosedale, Ind., under the style of Hanner & Conley.

Fred. Favret has purchased an interest in the Hardware business of J. P. Knowlton, at Brownville, N. Y., and the style has become Knowlton & Favret.

Freitag, Weinhardt & Co., Terre Haute, Ind., have added a stock of general Hardware and Sporting Goods to their plumbing and steam fitting business. Among improvements made in their store they mention a capacious Bolt case and Myers' Ladders.

A. Johnson & Sons have sold a fourth interest in their business to F. H. Abel, and are now running two stores, one in South Dayton, Tenn., under the name of A. Johnson & Co., and another in North Dayton, under the style of F. H. Abel & Co. The store in North Dayton was formerly occupied by W. C. Bailey, whose stock has been bought out.

S. G. Crankshaw has purchased a Hardware store in Mayville, Mich.

The store of S. L. Boyce & Son, Port Huron, Mich., was damaged by fire a short time since. The loss was small and was fully covered by insurance.

The Hardware store of S. L. Fenner, at Terre Haute, Ind., was robbed of \$50 worth of Cutlery and Revolvers a short time since.

J. H. Mills & Son have purchased the Hardware and Implement business of A. George, Garrison, Neb.

Darner Bros. have bought out W. A. Crandall, in Overton, Neb. The new firm will move into a new building in a few days. Their business is being conducted on a strictly cash basis.

R. C. Jordan has succeeded Jordan & Hamilton, at Ottawa, Ill., in the wholesale and retail Hardware, Stove, Tinware and Implement business.

E. P. Hutchens has succeeded J. Hill & Son, at Horse Cave, Ky.

M. B. Payne & Son are successors to C. F. Crandall's business, at Cassadaga Station, N. Y.

W. T. Wrather has sold out his business, at Paris, Tenn., to Chas. Lansdell, formerly of Wetumpka, Ala., who will continue at the old stand.

Rich & Lyons are successors to Rich Bros., at Brook, Ind.

O. J. Smith, Sidney, Neb., has disposed of his Hardware and Implement store to J. W. Harper & Son.

Warren & Clifford, Hazel, S. D., have sold out their Hardware business to Sheldon & McLaurin.

Morris & Frith, Kankakee, Ill., have purchased the Jno. Whitham Estate stock of Hardware, Stoves, &c., and have added materially to it. They have also made a number of improvements in the store, including an elevated office, steel ceiling, &c. An addition, 30 x 40 feet, has also been erected.

Harper & Beale, Paw Paw, Ill., have purchased the Clark Hardware stock from the heirs of G. W. B. Clark, who died in November last.

S. W. Rudd has disposed of his Hardware and Implement store, at Arlington, Texas, to McKinley & McNatt.

N. F. Lane, Phillips, Neb., has sold a half interest in his business to W. H. Beard. The firm style has been changed to N. F. Lane & Co.

C. O. Rucker has purchased a half interest in the Hill Hardware business, at Litchfield, Ill., and the stock has been removed to Ramsey, where operations will be continued under the style of Rucker & Hill. The firm will shortly take up the sale of Lumber, Furniture, &c.

Latham Bros. are successors to Castle & Latham, at Sandwich, Ill.

The Van Buren Hardware Company, Van Buren, Ark., have been incorporated with a capital stock of \$10,000.

Arnegard & Lofthus have succeeded P. L. Pritchard, in Hillsboro, N. D. They will build a new tin shop and use the one heretofore occupied for store purposes.

Biddle & Cahill, Richwood, Ohio, whose store was lately damaged by fire, are now in shape again. The loss sustained by them was about \$2000 and was fully covered by insurance.

Fish & Bennett, Williamson, N. Y., are adding a line of Hardware to their other goods. An addition, 20 x 36 feet, is in course of erection.

Poellot & Robison, Irwin, Pa., are selling out their Hardware business.

Frank B. Weaver has bought Mr. McClelland's interest in the firm of Moulthrop Bros. & McClelland, Falls Creek, Pa. The new style is Moulthrop Bros. & Weaver.

Spena & Keraus have purchased the business formerly conducted by Mrs. H. C. Street, Keene, Kan.

J. R. Carr is successor to H. C. Roe, at Waldo, Kan.

Bowden & Bowden, Lockhart, Texas, have dissolved and E. L. Bowden is now sole proprietor.

The Billbrough-Jones Hardware Company are successors to the business of Evans-Ray Hardware Company, Denver, Col.

The Halyard Hardware Company have recently incorporated, at Joplin, Mo., with a capital stock of \$20,000. They will conduct a wholesale and retail business.

O. S. Mills Hardware Company will remove from Tunkhannock to Sayre, Pa.

John Schiltz has purchased the Moss Hardware stock, at Aurora, Ill.

Robert Klaehn has purchased his partner's interest in the firm of Scheumann & Klaehn, Fort Wayne, Ind., and is continuing under his own name.

F. Blanchard & Co. are successors to Fred. Blanchard, at Montpelier, Vt.

Roof & La Favor have succeeded Rush, Roof & La Favor, at Parnell, Mo.

A. J. Dinwiddle is now conducting under his own name the business formerly carried on by Dinwiddle & Noble, Hamburg, Iowa.

Durr & Crossley, Union Springs, Ala., have sold out to J. L. Paulk.

Bender & Woods have succeeded Hedge & Brown in the Hardware, Stove and Implement business, at Whiting, Kan.

J. J. Jenkins, Edwardsdale, Pa., has bought out Geo. Bray's stock and will occupy Mr. Bray's stand April 1, uniting his own stock with that just acquired.

Jenks & Pickett are a new firm at Jackson, Mich. They are handling a line of general Hardware, Stoves

and then exposed to the weather. The alternate sections not protected are badly rusted, the remaining space as good as ever. Sample cans will be sent free on application.

F. E. Kohler & Co.

F. E. Kohler & Co., Canton, Ohio, advise us that they are commencing to manufacture shovels which will be known as the Anti-Combine. They will be furnished with either long or D handle and either black or polished. As rapidly as dies are finished they intend to furnish also scoops, coal shovels, &c.

Disstons' D 100 Hand Saws.

Henry Disston & Sons, Philadelphia, Pa., have recently put on the market their D 100 hand saws, made in rip, hand and gentlemen's panel styles in sizes 16 to 30 inches inclusive. It has a skew back, full carved apple handle, five improved screws, except the panel, which has four, and the rip saws have graduated teeth. The blades are made of spring steel, patent ground and tempered, and both handles and blades are highly polished.

Lawrence Brothers.

Lawrence Brothers, Sterling, Ill., are now manufacturing a line of light and heavy strap and T hinges, as well as their Lawrence patent hinges.

Accurate Window Glass Cutter.

Dana Hardware Company, Boston, Mass., are manufacturing the Accurate window glass cutter as here illustrated. Fig. 1 shows the device for cutting glass where

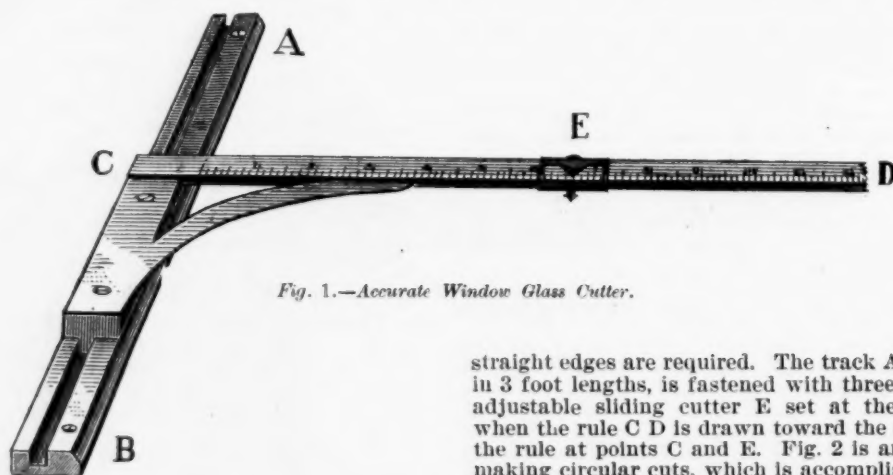


Fig. 1.—Accurate Window Glass Cutter.

and House Furnishing Goods. Mr. Jenks has had an experience of 16 years in the Hardware and Stove business.

W. H. Haner has purchased the Hardware business of R. B. Kilbury, Plain City, Ohio.

Packard Hardware Company have purchased the old established business of F. L. Sowle & Co., 90 Purchase street, New Bedford, Mass., dealers in Hardware, Builders' Supplies, Bicycles, &c.

Forbes & Co., Red Springs, N. C., were dissolved on the 28th ult. W. H. Carr & Co. will continue the business. Mr. Carr was a member of the old firm.

Coplin & Neu have succeeded H. M. Powell in the Hardware, Stove, Tinware and Sporting Goods business, at Taylorville, Ill.

Miscellaneous Notes.

Mannocitin.

Charles H. Besly & Co., 10-12 North Canal street, Chicago, Ill., are the exclusive agents in the United States for a rust preventive known as Mannocitin. It is a liquid put up in cans, kegs and barrels, the cans holding variously pints, quarts, $\frac{1}{2}$, 1, $2\frac{1}{2}$ and 5 gallons; kegs, $15\frac{1}{2}$ gallons, and half and full barrels containing 31 and 50 gallons respectively. It can be applied to any iron or steel surface to prevent corrosion, and in this connection they send out a kitchen knife, both sides of which have been partially treated with Mannocitin, on one side at the top and the other at the bottom of the blade,

straight edges are required. The track A B, which comes in 3 foot lengths, is fastened with three screws, and the adjustable sliding cutter E set at the required point, when the rule C D is drawn toward the operator, holding the rule at points C and E. Fig. 2 is an attachment for making circular cuts, which is accomplished by transferring the slide E from the rule C D to the proper position on circular cutter X and then sweeping the necessary circle. Some of the advantages claimed by the manufacturers are more accuracy than with hand cutter and straight edge, dispensing with measurements on each



Fig. 2.—Attachment for Cutting Circles.

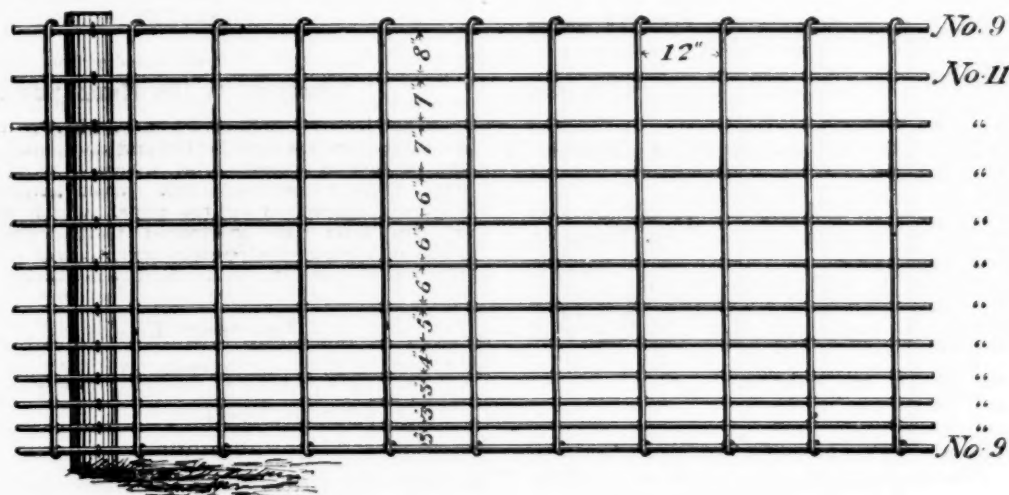
end of the sheet, less breakage, saving of time, is portable and can be carried to a job, and the comparative low price at which it can be sold.

Clinton Electrically Welded Wire Fence.

Clinton Wire Cloth Company, Clinton, Mass., manufacturers of various styles of wire fencing for half a century, are just introducing a variety of wire fence consisting of horizontal and vertical strands, each of which is electrically welded by automatic machinery as the hammer charged with an electric current strikes each intersection of the wires. This style of wire fence, protected by their own patents, is welded instantaneously by electricity, the output of a machine, it is said, being much greater than is obtainable from twisting machines, thus reducing the labor cost to a minimum. All wires run in straight lines, nothing being lost in twists or diagonal strands, which, together with the high speed of the machine, enables the

makers to produce the fence at a less cost than any other style they make having meshes and wires of similar size. Severe tests have demonstrated that a strain sufficient to break the wire will not loosen the weld, and the manufacturers guarantee that every joint is equally as strong as the wire. Large sizes of wire which cannot be used on any twisting machine are welded by this process as easily as the ordinary sizes used for field fences, thus enabling the purchaser to select a style giving any desired

prevents any liability of the blade working loose on the handle. The axe can be easily carried in hip or sporting pocket for hunting or sporting purposes, securing specimens, &c. The point is made that the implement is complete in itself, no belt or sheath being required. This convenient small tool is made in three sizes, Nos. 0, 1 and 2, weighing 13, 18 and 23 ounces, respectively, the length over all being 10, 11 and 12 inches, in the order named. A similar article is also made with hickory handles in three



Clinton Electrically Welded Wire Fence.

strength. A large variety of heights, also meshes of various lengths and widths, can be made on the same machine. It is pointed out by the makers that with this fence railroad companies can comply with all requirements of State laws relating to fencing of right of way at the least expense, as it can be produced in very large meshes, which require the minimum amount of wire and labor. It can also be made with small meshes made from light wire at the bottom and large meshes made from heavy wire at the top, thus affording protection from small animals and vicious cattle, or if desired the vertical or stay strands can be placed on narrow centers extending part way toward the top of the fence, while any required alternate stays can be extended to embrace top and bottom horizontal strands. The engraving herewith shows the 12-bar 58-inch standard fence, the vertical strands or stays being No. 12 gauge, placed on 12-inch centers. Samples of the fence will be made on application to the home office or any of their branches in Boston, New York, Chicago or San Francisco.

Marble's Safety Pocket Axe.

W. L. Marble, Gladstone, Mich., is offering Marble's safety pocket axe, for sportsmen and others, as here shown both open and guarded. A steel guard folds back into the handle, entirely out of the way, as shown in Fig. 1. The blade is made of solid tool steel, finely tempered and



Fig. 1. - Marble's Safety Pocket Axe, Open.

highly polished. The handle of mild steel is nicked on copper, with handle plates of engraved hard rubber. The guard, of sheet steel, is hinged on a spring in such a man-



Fig. 2. - Safety Pocket Axe, Guarded.

ner that either open or closed it is firmly held in place. The head of the axe has an oblong semicircular recess milled in either side to receive the slotted end of the handle, which is accurately milled to a close fit and rigidly held by a 1/4-inch steel screw, which effectually

sizes about the same weights and lengths, but sold at a lower price.

Crescent Belt Fasteners.

Crescent Belt Fastener Company, 76 Lexington avenue, New York, are offering the Crescent steel belt fasteners herewith shown. The plates are referred to as adapted to leather, rubber, Gandy, canvas and camel's hair belts of all widths and thicknesses. Fig. 1 shows the joining of belts with two, four or six hole plates, by means of bifurcated rivets, which can be driven through

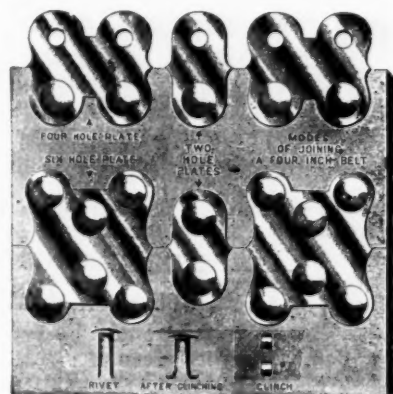


Fig. 1. Belt Joined with Crescent Belt Fasteners.

the belt without removing any material and thus weakening it. In joining a belt the rivet is placed in a rivet starter furnished, and the prongs driven through so they will spread crosswise of the belt and clinch on the reverse side, leaving the pulley side perfectly smooth. Six-hole plates are not designed for pulleys smaller than 4 inches. The plates can be curved after being riveted to conform to the pulley over which the belt runs, with or



Fig. 2. - Crescent Belt Fastener Joint Passing Over Pulleys.

without a special tool furnished. Fig. 1 shows the various styles of plates with the rivet before and after clinching. Fig. 2 is designed to represent the appearance of the joined ends over the pulley. The manufacturers refer to it as a rapid seller, and will send samples and full particulars to any who desire a good side line.

Wire Fence Staple Puller.

The Springfield Drop Forging Company, Springfield, Mass., are manufacturing the Date wire fence staple puller, here shown. It is designed for drawing wire staples from fence posts as well as driving them in. It is drop forged from tool steel, is highly polished, has selected hickory

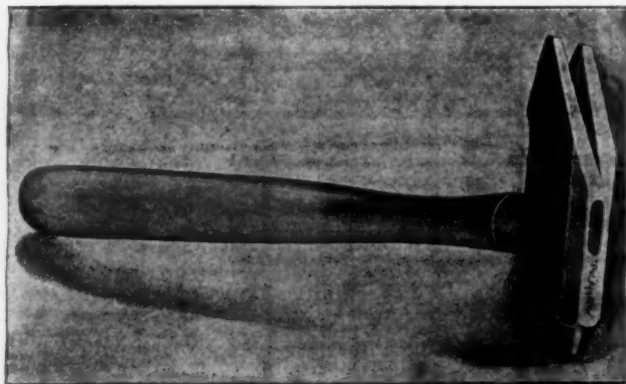


Fig. 1.—Date Wire Fence Staple Puller.

handle and weighs 1 pound. The claws are beveled to a wedge on the inside, thus making the hammer positive in action. Fig. 2 shows the tool in operation, representing the claws placed above the staple and then driven downward, which serves to loosen and withdraw the staple without injury to wire or staple. It is also offered for

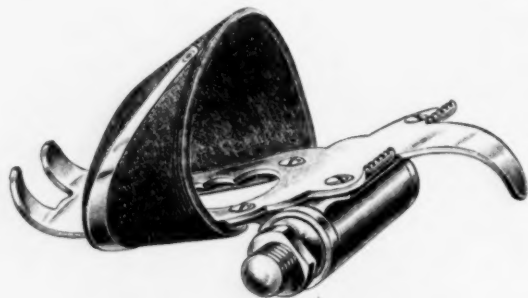


Fig. 2.—Method of Using Puller.

carpenters, tinnerns, machinists and farmers. The works and post office address are at Brightwood, a suburb of Springfield.

The S. & G. Combination Pedal.

An illustration is herewith given of the S. & G. combination pedal, which combines a toe clip with a pedal, and is manufactured by the Sidway Mfg. Company, 240 West Lake street, Chicago, for whom T. H. Cranston &



S. & G. Combination Pedal.

Co., 54 to 60 Wabash avenue, Chicago, are selling agents. The toe clip is a special feature of this pedal and is said to be easy to catch, will not hold the foot in case of a fall and will not mar the toe of the shoe. The pedal is handsomely finished and provided with an absolute cone lock, which prevents the cone from tightening on the

boxes and permits of a positive cone adjustment of 1-352 inch.

The Hardware and grocery business of Henry Veith, Lincoln, Neb., has been incorporated under the style of Henry Veith Company, with a capital stock of \$25,000. Mr. Veith, the senior member of the firm, has been for the past 30 years engaged in business in Lincoln.

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Lane Store Ladder.

Lane Brothers Company, Poughkeepsie, N. Y., have made improvements in their store ladder, as shown in the accompanying illustration. An important feature of this outfit is that the rail is approximately the same width as

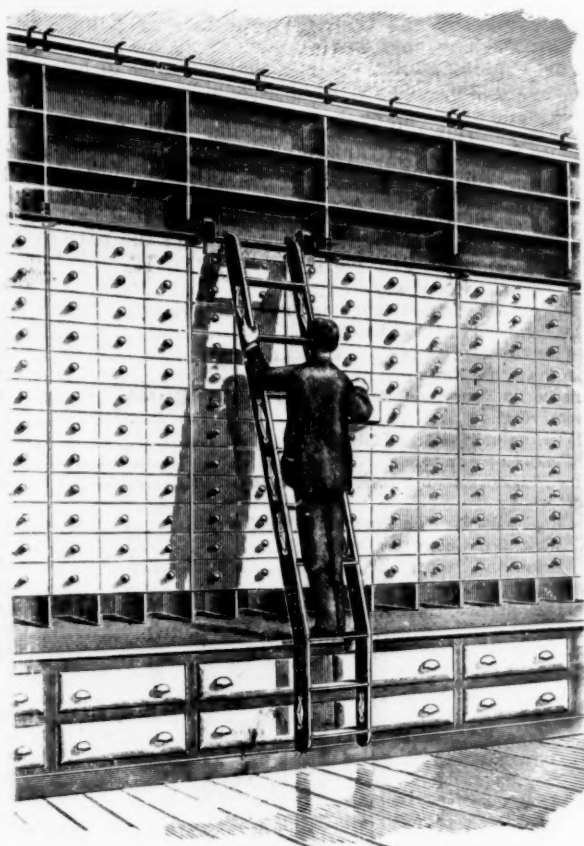


Fig. 1.—Lane Store Ladder in Use.

the thickness of ordinary shelves, and being equipped with adjustable brackets, which are to be fastened to the uprights and the rails laid in them, neither rail nor brackets interfere with the utility of the shelf room. The ladder

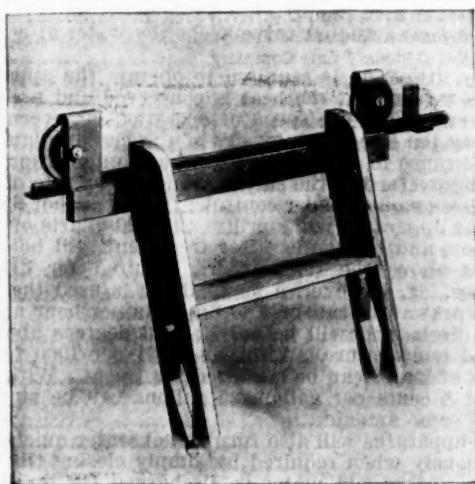


Fig. 2.—Ladder Carriage.

carriage proper is constructed entirely of steel and fitted with ball bearing wheels having a fiber tread. There is no rail necessary on the counter or floor, but rubber guard rollers are secured to the lower part of the ladder in proper position to bear against the edge of the counter ledge. The company sell the track and fixtures separately

or build the ladder to order, with extra bends if necessary, and furnish equipment complete as customers desire.

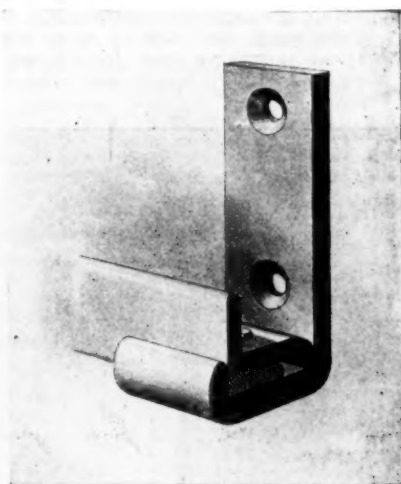


Fig. 3.—Track for Shelving.

Attention is directed to the company's advertisement in another column.

The Waterhouse-Forbes Sterilizer.

The accompanying engravings show the sterilizer just placed on the market by the Waterhouse-Forbes Company, 220 South Fifth street, Philadelphia.

The sterilizer is designed principally for the sterilization of water, although milk or other liquid may with it be sterilized equally as well. A feature of the sterilizer

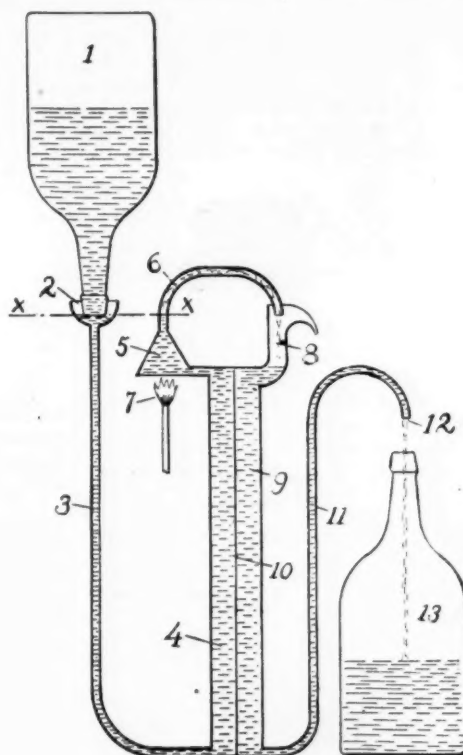


Fig. 1.—Sectional View of Sterilizing Apparatus.

is that it sterilizes and delivers water with great rapidity, and delivers it at a temperature almost equal to that at which it enters the machine and without the flat taste so objectionable in water boiled in the ordinary way. The principle of the apparatus is shown in Fig. 1, which is a diagrammatic view of the aerostatic feed pattern. The unsterilized water is supplied from the inverted bottle 1. From the bottle the water runs into the cup 2, then down through the pipe 3 into the compartment 4 of the heat exchange (shown in Fig. 2), which it fills. When the compartment is filled the water runs into the heater 5, and rises in the pipe 6 to the level X, where it stays. No more water will run from the bottle 1, because its mouth is sealed by the water in the cup 2

at the level X. The burner 7 (for gas or kerosene) is now lighted and heat applied under the heater 5, which causes the water in the heater to boil. In boiling the water rises in the pipe 6 and flows over into the cup 8, just as a pot on a kitchen range will boil over. It will thus be seen that it is impossible for any water to pass through

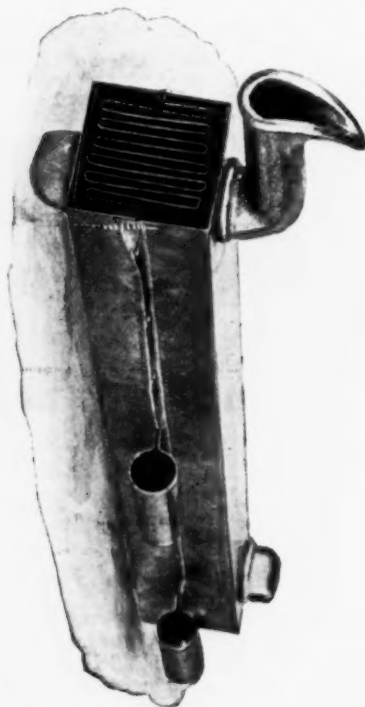


Fig. 2.—Heat Exchange.

the apparatus until it has boiled, as until it is boiled it cannot rise sufficiently to pass out of the pipe. The boiling lasts for but the fraction of a second, and once the water has passed through the pipe 6 it is removed from where heat can again reach it. When some of the water has boiled over, as stated, the level of the water in the

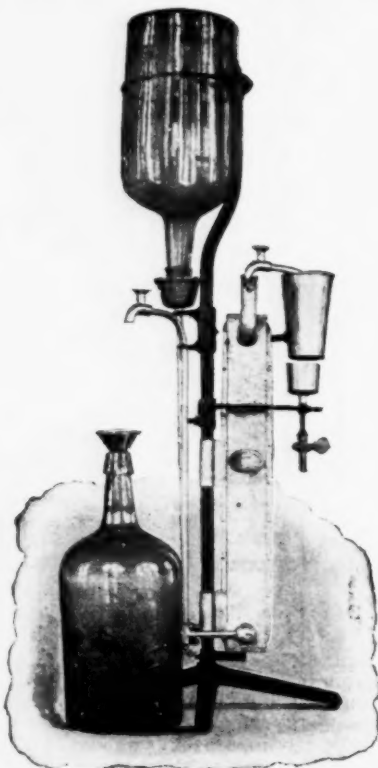


Fig. 3.—Portable Sterilizer.

heater 5 and that in the cup 2 is lowered. The mouth of the bottle is by this lowering exposed, allowing of the entry of a small quantity of air which causes a corresponding quantity of water to run out of the bottle and refill the cup and heater to the level X again. The bottle mouth is then sealed as before and the operation continued repeatedly. The water continuing to boil over

into the cup 8 quickly fills the compartment 9 of the heat exchange. When this compartment is filled the water runs out of the pipe 11 at the opening 12 into a receiver, as shown. While passing through the compartment 9 the heat of the water, which is boiling hot, is transferred through the thin metal partition or diaphragm 10 to the cold water passing up through compartment 4, so that the water boiled in the heater passes out of the apparatus nearly as cold as the water entering, while the cold water entering becomes heated in the opposite manner and reaches the heater at a high temperature. The only heat necessary to keep the apparatus running continuously is that required to bring the already highly heated water reaching the heater to a boil.

Fig. 2 shows the heat exchange with its compartments formed of galvanized sheet iron, the openings sufficient to allow of thin sheets of water passing on each side of the partitions.

Fig. 3 shows the portable or aerostatic feed pattern of sterilizer for domestic use. Fig. 4 shows the pattern designed for fixture over a sink and receiving water from

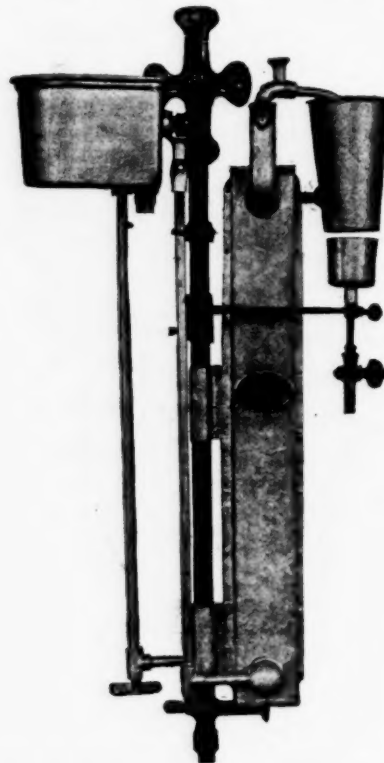


Fig. 4.—Sterilizing Apparatus for Sink Use.

a regular water supply, the same entering a tank in which a float actuated valve keeps the water at a proper level.

Very little fuel is required to operate the apparatus, for the reason that the heat is conserved and used over and over again. The speed of operation is governed entirely by the size and intensity of the heating flame and the difference in the temperature before and after treatment is governed in the same manner. The rate of operation is thus quite under control. If a large, hot flame is used the apparatus will sterilize 12 to 20 quarts of water per hour, and the water after treatment will be 5 to 8 degrees above the temperature required for drinking purposes. If, however, a small flame is used the apparatus works at the rate of 4 to 8 quarts per hour and the water discharged will be only 1 to 3 degrees above its original temperature. With gas at \$1 per 1000 feet, 15 gallons of water can be sterilized for 1 cent. With kerosene at 8 cents per gallon, 25 gallons can be sterilized for the same amount.

The apparatus will also furnish hot water quickly and continuously when required by simply closing the opening where the cold water is discharged (12 in Fig. 1), with the finger or otherwise. Stoppage in this manner causes the hot water to overflow at the spout of the cup 8 in Fig. 1.

The apparatus has been thoroughly tested in bacteriological laboratories by passing through it large quantities of water impregnated with disease germs, and the resulting sterilized water upon being tested has been found to be absolutely pure. In communities where the water is bad or impure the apparatus should prove a boon, as it is said to insure a plentiful supply of pure water as pleasant to the taste as spring water.

The sterilizer will be sold through the hardware, house furnishing and plumbing trades.

Current Hardware Prices.

MARCH 15, 1899.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices, while lower prices are often given to larger buyers.

The character @ is used to indicate a range of price; thus discount 50 & 10 @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Many of the lists referred to in the following quotations are given in *The Iron Age* Standard Hardware Lists (price 50 cents). On many other articles, however, the different manufacturers have their own lists, which they will send to the trade on application. In the advertising columns will be found the announcements of manufacturers of nearly all kinds of Hardware, who will be pleased to furnish the trade information in regard to their goods and prices.

March, 1899.—In the present condition of the market many advances are being announced by manufacturers, but in some cases lower prices are made by the whole-sale trade who have stocks on hand purchased at former quotations.

Adjusters Blind—

Domestic, # doz. \$3.00... 33 1/2 @ 33 1/2 @ 10%
North's... 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent... 40%
Taplin's Perfection... 45%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Burton's No. 1... # doz. pr. \$1.00
Burton's No. 2... # doz. pr. \$0.75
Fernald's Wire... # doz. pr. \$0.75

Anvils—American—

Eagle Anvil, # 10... 7 1/4 @ 7 1/4 @
Hay-Budden, Wrought... 8 1/4 @ 8 1/4 @
Horseshoe brand, Wrought... 9 1/4 @ 9 1/4 @
Samson, # 10... 8 1/4 @ 8 1/4 @
Trenton, Wrought... 8 1/4 @ 8 1/4 @

Imported—

Armitage's Mouse Hole... 8 1/4 @ 9 1/4 @
Solid Swedish Steel... 10 1/4 @ 10 1/4 @
Peter Wright's... 9 1/4 @ 9 1/4 @

Anvil, Vise and Drill—

Millers Falls Co., #18.00... 20%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Common Double Spur... 7 1/2 @ 10 @ 30%
Boring Machine Augers... 7 1/2 @ 10 @ 30%
Car Bits, 12-in. twist, 60 & 10 @ 70 & 10%
Jennings' Pattern Car Bits... 60 @ 60 @ 10%
Jennings' Pattern Auger Bits... 70 @ 10 @ 75 & 5%

Adams Art Auger Bit... 30%
Cincinnati Bell Hangers' Bits... 40%
Ford's Auger and Car Bits... 40 @ 10 @ 40 @ 10 @ 10%

Forstner Pat. Auger Bits... 25%
C. E. Jennings & Co., No. 10 ext. lip. R. Jennings' list... 40 @ 40 @ 10%

No. 30. R. Jennings' list... 50 @ 10 @ 60%

Russell Jennings... 25 @ 10 @ 25%

L'Hommedieu Car Bits... 10 @ 10 @ 10%

Pugh's Black... 30%

Pugh's Jennings' Pattern... 35%

Wright's Jennings Bits (R. Jennings' list)... 50%

Bit Stock Drills—

Standard list... 60 & 10 @ 45 @ 10 @ 10%

Cincinnati, for metal... 50 @ 50 @ 10%

Syracuse, for wood... 40%

W. & B. Wood Boring Brace Drills... 40%

Expansive Bits—

Clark's small, #18; large, #26... 20 @ 50 @ 10%

Lavigne's Clark's Pattern, No. 1, # doz. #26; No. 2, #18... 60 @ 50 @ 10%

Steer's No. 1, #26; No. 2, #18... 40 @ 40 @ 5%

Swan's... 40 @ 40 @ 10%

Gimlet Bits—

Common Double Cut... # gr. \$2.75 @ 3.25

German Pattern... # gr. \$5.00

Double Cut, makers' lists... 60 @ 50 @ 10%

See also *Gimlets*.

Hollow Augers—

Bonney's Adjustable, # doz... \$10.00

Cincinnati Adjustable... 85 @ 10%

Cincinnati Standard... 85 @ 10%

Douglas... 30 1/2 @ 30 1/2 @ 10%

Stearns', Common, No. 6... 10%

Stearns', all other numbers... 20 @ 10%

Ship Augers and Bits—

Ford's... 40 @ 10 @ 40 @ 10 @ 10%

L'Hommedieu's... 15 @ 10 @ 15 @ 10 @ 10%

Watrous'... 40 @ 40 @ 10%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:

Handled... # gr. \$3.00 @ 3.25

Unhandled, Shouldered... # gr. 65 @ 70%

Unhandled, Patent... # gr. 70 @ 75%

Fig Awls:

Unhandled, Patent... # gr. 33 @ 35%

Unhandled, Shouldered... # gr. 65 @ 70%

Scratch Awls:

Handled, Common... # gr. \$3.25 @ 3.75

Handled, Socket... # gr. \$11.00 @ 12.00

Awl and Tool Sets—See

Sets, Awl and Tool.

Axes—

First quality, best brands... \$5.00 @ 5.25

First quality, other brands... \$4.25 @ 4.75

Jobbers' Special Brands, good quality... 4.00 @ 4.75

Cheap Handled Axes... \$4.75 @ 5.25

Beveled, add 25¢ # doz.

Axle Grease—See Grease, Axle

Axles—

Concord, loose collar... 4 1/2 @ 4 1/2 @

Concord, solid collar... 5 @ 5 @

No. 1 Common... 3 1/2 @ 3 1/2 @

No. 1 1/2 Common, New Style... 4 @ 4 @

No. 2, Solid Collar... 4 1/2 @ 4 1/2 @

No. 7, 8, 11 to 14... 60 @ 10 @ 5%

No. 15 to 18... 50%

No. 19 to 22... 70%

Balances—

Sash—

Caldwell low list... 80%

Vanderbilt... 80%

Spring—

Spring Balances... 50 @ 10 @ 60%

No. 2000... 20 30

Chatillon, # doz... \$0.60 70 1.50

Chatillon Straight Balances... 50%

Chatillon Circular Balances... 60%

Barb Wire—See Wire, Barb

Bars—Crow—

Steel Crowbars, 10 to 40 lb. # 2 1/2 @ 2 1/2 @

Beams, Scale—

Scale Beams, List Jan. 12, '82... 50 @ 10%

Chatillon's No. 1... 40%

Chatillon's No. 2... 50 @ 10 @ 50 @ 10 @ 5%

Beaters—Egg—

New Dover (Dover Stamping Co.)... # doz. 75¢ # gr. \$7.50

Dover, Ex. Family size... # doz. \$2.00

New Dover... # doz. \$7.50

Dover (Standard Co.), No. 10, # gr. \$5.50; No. 5, \$6.00; No. 15, \$12.00

Dover (Tap In Pat. Imp.), No. 100, # gr. \$7.00; No. 150, # doz. \$2.00

Lebanon... # doz. \$2.75 @ \$3.00

Spiral... # doz. \$4.25 @ \$4.50

Standard Lyon, # doz. \$1.75; # doz. \$3.00

Wonder (S. S. & Co.)... # doz. 75¢

Bellows—

Standard list... 70 @ 10 @ 70 @ 10 @ 5%

Often sold at net prices:

Inch... 30 32 34 36 38 40

Each... \$3.75 4.00 4.75 5.25 6.00 7.00

Extra Length... \$1.50 5.00 5.50 6.25 7.00 8.50

Molders—

Inch... 9 10 11 12 14 16

Per doz. \$6.00 6.50 7.75 8.75 11.00 13.25

Hand—

Inch... 6 7 8 9 10 12

Per doz. \$3.25 3.50 3.75 4.50 5.25 6.00

Bells—Cow—

Wrought, Sheep and Cow... 60 @ 10 @ 70%

Kentucky... 75 @ 10%

Western... 70%

Jersey... 75 @ 10%

Texas Star... 50 @ 10%

Door—

Gong, Yankee... 60 @ 10%

Lever, R. & E. Mfg. Co.'s... 60 @ 10%

Lever and Pull, Sargent's... 45 @ 10 @ 45 @ 10 @ 5%

Hand—

Hand Bells, Polished... 60 @ 10 @ 0 @ 70%

White Metal... 60 @ 10 @ 0 @ 70%

Nickel Plated... 50 @ 10 @ 60%

Swiss... 60%

Silver Chime... 40 @ 40 @ 10%

Miscellaneous—

Farm Bells... # 2

Steel Alloy Church and School... 50 @ 10%

Belting

Rubber—

Common Standard... 75 @ 10 @ 75 @ 10 @ 5%

Extra... 70 @ 70 @ 10%

Standard... 70 @ 10 @ 75%

Leather—

Best Oak Tanned... 60 @ 10 @ 60 @ 10 @ 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Brettel Tire Upsetter, #15... 50%

Green River Tire Benders and Upsetters... 20%

Stoddard's Lightning Tire Upsetters... 40 @ 50%

Bicycle Goods—

Lane's Cycle Hanger... 83 1/2 @ 5%

John S. Leng's Son's 1899 list:

Balls... 50%

Chain... 50%

Parts... 50%

Spokes... 50 @ 10%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—

See *Augers and Bits*.

Bit Holders—See Holders.

Blind Adjusters—See Ad-

justers, Blind.

Blind Fasteners—See Fast-

eners, Blind.

Blind Staples—See Staples,

Blind.

Blocks—

Common Jap'd Sheaves... 75 @ 75 @ 5%

Eddy's All Steel, Common Bushed... 70%

Eddy's All Steel, Bronze Bushed... 60 @ 5%

Hartz All Steel, Common Bushed... 50 @ 10%

Ford's Star Brand, Self Lubricating... 70%

Hollow Steel, Ford's Pat. Star Brand... 50 @ 10%

Lane's Pat. Adj., Perfect Safety and Junior... 30%

Stowell's Novelty, Mal. Iron... 60 @ 10%

See also *Machines, Hoisting*.

Boards Stove—

Manufacturers quote... 80 @ 10 @ 40%

Jobbers often sell... 40 @ 10 @ 50%

Bolts—

Carriage, Machine, &c.—

Common, list Jan. 30, '95... 75 @ 10 @ 80%

Norway Iron, #3.00, list Oct. 7, '84... 75 @ 10 @ 75 @ 10 @ 5%

Phila. Eagle, #3.00 list... 85 @ 15%

Bolt Ends, list Jan. 30, '95... 80 @ 80 @ 5%

Machine list June 12, '96... 80 @ 80 @ 5%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch... 3 4 5 6 8

Per doz... \$0.27 30 38 48 66

Cast Iron Bottom, Japanned:

Inch... 6 8 10 12 15

Per doz... \$0.83 1.05 1.65

Cast Iron Chain, Flat, Japanned:

Inch... 6 8 10 12 15

Per doz... \$1.10 1.32 1.87

Cast Iron Shutter, Brass Knobs:

Inch... 6 8 10 12 15

Per doz... \$0.49 77 88

Wrought Barrel Brass Knob:

Inch... 3 4 5 6 8

Per doz... \$0.44 50 61 70 1.28

Ives' Patent Door... 65 @ 65 @ 10%

Wrought Flush... 50 @ 10 @ 60%

B. K. Sargent's list... 60 @ 10 @ 60 @ 10 @ 5%

B. K. Stanley's list... 60 @ 10 @ 60 @ 10 @ 5%

Sunk, Sargent's or Stanley's list... 50 @ 10 @ 50 @ 10 @ 5%

Wrought Shutter, Standard list... 60 @ 10 @ 70 @ 70%

Wrought Square, Standard list... 75 @ 75 @ 10%

Stove and Plow—

Plow... 70 @ 70 @ 10%

Stove, list August 27, 1898... 70 @ 10%

Tire—

Common, list Feb. 28, '83... 70 @ 10 @ 75%

American Screw Company:

Norway Phila., list Oct. 16, '84... 75 @ 10%

Eagle Phila., list Oct. 16, '84... 80 @ 10%

Keyston, Phila. list Oct. 16, '84... 80 @ 10%

Bay State, Phila. Feb. 28, '88... 70 @ 10%

Franklin Moore Co.:

Norway Phila., list Oct

Tanged and Miscellaneous.

Buck Bros. 30¢
Charles Buck. 30¢
Tanged Firmer. 40¢
L. & I. J. White, Tanged. 25¢
Cold Chisels, good quality. 14¢
Cold Chisels, fair quality. 12¢
Cold Chisels, ordinary. 7¢

Chucks—

Beach Pat., each \$8.00. 20¢
Graham Patent. 30¢
Morris's Adjustable, each \$7.00. 25¢
Syracuse, Balz Pat. 30¢
Skinner Patent Chucks:
Combination Lathe Chucks. 40¢
Drill Chucks. 30¢
Independent Lathe Chucks. 40¢
Improved Planer Chucks. 20¢
Universal Lathe Chucks. 40¢
Union Mfg. Co.:
Combination. 40¢
Czar Drill. 30¢
Geared Scroll. 30¢
Independent. 40¢
Union Drill. 30¢
Universal. 40¢
Face Plate Jaws. 35¢

Clamps—

Adjustable Cincinnati. 25¢
Adjustable, Hammers. 20¢
Adjustable, Stearns. 30¢
Cabinet, Sargent's. 45¢
Carriage Makers', P. S. & W. Co. 40¢
Carriage Makers', Sargent's. 50¢
Cincinnati Carpenters', &c. 25¢
Joiners' Clamps, Tatum's. 25¢
R. I. Tool Co.'s Wrought Iron. 25¢
Saw Clamps, see *Vices, Saw*.
Stearns Malleable, with Wrought Iron. 75¢
Stearns Steel. 25¢
Itum's Joiners' Adjustable. 25¢
Tatum's Quilt, Cabinet, &c. 40¢
Warner's. 40¢

Cleaners, Walk—

Star Socket, All Steel. \$4.00 net
Star Shank, All Steel. \$3.75 net

Cleavers, Butchers'—

Foster Bros. Flat Hds., 30¢; Rd. Hds., 40¢
New Haven Edge Tool Co.'s. 40¢
Nichols Bros., Flat Hdl., 30¢; Rd. Hdl., 40¢
Fayette R. Plumb. 35¢
P. S. & W. 35¢
L. & I. J. White. 25¢

Clippers—

Chicago Flexible Shaft Company:
Handy Toilet. \$7.20
Mascoite Toilet. \$8.40
Monitor Toilet. \$9.00
Stewart's Patent. \$10.00
Hotchkiss Horse Clippers, \$ doz.:
No. 10, 18; No. 30, \$15.00; No. 22, \$13.50; No. 20, \$13.50; No. 8, \$10.80.
Hotchkiss Toilet Clippers, \$ doz.:
No. 1, \$9.80; No. 101, \$10.80; No. 201, \$10.80; No. 300, \$13.20; No. 500, \$15.

Clips, Axle—

Size and Superior 1/4 and 5/8 inch. 75¢
Norway, 1/4 and 5/8 inch. 70¢

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.). 70¢

Coffee Mills—See Mills, Coffee.**Collars, Dog—**

Brass, Pope & Stevens' list. 40¢
Chapman Mfg. Company, new list. 40¢
Embossed, Gift, Pope & Stevens' list. 30¢
Leather, Pope & Stevens' list. 40¢

Combs, Curry—

Hotchkiss' List Nov. 20, '96. 25¢
New York Stamping Co., List Sept. 17, '97. 25¢
New Centaur Spring Curry Comb:
With Wire Handle. \$ doz. \$1.20
With Strap Handle. \$ doz. \$1.60

Compasses, Dividers, &c.

Ordinary Goods. 70¢
Bemis & Call Co.'s:
Dividers. 65¢
Calipers, Call's Patent Inside. 55¢
Calipers, Double. 70¢
Calipers, Inside or Outside. 70¢
Calipers, Wing. 60¢
Compasses. 50¢
J. Stevens A. & T. Co. 25¢

Coolers, Water—

S. S. & Co.: 2-gal., \$2.70; 3-gal., \$3.20;
4-gal., \$3.80; 6-gal., \$4.75; 8-gal., \$7.20; 14-gal., \$14 each 60¢

Coopers' Tools—

—See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab and Fancy, 1/2 55¢, 3/4 80¢
Braided, White, 1/2 40¢, 3/4 120¢
Cable Laid Italian. 14¢
Common India. 8¢
Cotton Sash Cord. 14¢
Patent Russia. 13¢
Cable Laid Russia. 13¢
India Hemp, Braided. 13¢
India Hemp. 10¢
Patent India. 10¢
Pearl Braided. 14¢
Massachusetts, White. 17¢
Eddystone Braided Cotton. 18¢
Harmony Cable Laid Italian. 18¢
Oswan Mills:
Crown, Solid Braided White. 18¢
Braided, Giant, White. 18¢
Peerless:
Cable Laid Italian. 16¢
Cable Laid Russian. 18¢
Cable Laid India. 18¢
Braided India. 18¢
Samson:
Braided, Drab Cotton. 39¢
Braided, Italian Hemp. 31¢
Braided, Linen. 35¢
Braided, White Cotton. 27¢

Silver Lake:

A quality, Drab, 40¢. 15¢
A quality, White, 35¢. 15¢
B quality, Drab, 35¢. 15¢
B quality, White, 30¢. 15¢
Italian Hemp, 40¢. 15¢
Linen, 57¢. 15¢

Wire, Picture—

Braided or Twisted. 85¢

Corn Knives and Cutters

—See *Knives, Corn.*

Crackers, Nut—

Acme, Japanned, 1/2 gr. \$30. 40¢
Acme, Nickel Plated, 1/2 gr. \$30. 20¢
Turner & Seymour Mfg. Co. 50¢

Cradles—

Grain. 55¢

Crayons—

White Round Crayons, 1/2 gross. 50¢
Cases, 100 gr., \$4.50; at factory. 25¢
D. M. Steward Mfg. Co.:
Metal Workers', 1/2 gr. \$3.50. 25¢
Railroad, 1/2 gr. \$2.00. 25¢
Rolling Mill, 1/2 gr. \$2.50. 25¢
Soapstone Pencils, 1/2 gr. \$1.50. 25¢
See also *Chalk.*

Creamery Pails—See Pails.

—See *Creamery.*

Crooks, Shepherds'—

Fort Madison, Heavy. \$ doz. \$7.00
Fort Madison, Light. \$ doz. \$6.50

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden. \$ doz. \$10.00

Curry Combs—

—See *Combs, Curry.*

Cutters—Meat—

American. 30¢
Nos. 5¢
Each. \$7.10
Connecticut, No. 0, \$2.00; No. 1, \$2.50;
No. 8, \$3.00; No. 12, \$3.50
Enterprise. 25¢
Nos. 5¢
Each. \$2.50
Dixon's, 1/2 doz. 35¢
Nos. \$14.00
Hale's, 1/2 doz. \$17.00
Nos. \$11.12
Home No. 1, 1/2 doz. \$26.00
Little Giant, 1/2 doz. \$30.10
Nos. \$305.310
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00
Miles' Challenge, 1/2 doz. \$45.45
Nos. \$22.00
New Triumph No. 605, 1/2 doz. \$34.00
Woodruff's, 1/2 doz. \$33.25
Nos. \$100.150
Chadborn's Smoked Beef Cutter, 1/2 doz. \$60.00
Enterprise Beef Shavers. 25¢

Slaw and Kraut—

Tucker & Dorsey Mfg. Co.:
Kraut Cutters. 50¢
Slaw Cutters, 1 Knife, 1/2 gr. \$15.15
Slaw Cutters, 2 Knife, 1/2 gr. \$20.27

Tobacco—

All Iron, Cheap. \$ doz. \$4.50
Enterprise. 25¢
National. 30¢
Sargent's, 1/2 doz. \$24.00

Washer—

Appleton's, 1/2 doz. \$16.00
Bonney's. 60¢
Cincinnati. 25¢
Tatum's. 25¢

Diggers, Post Hole, &c.—

Gem, Improved. \$ doz. \$8.50
Iwan's Improved Post Hole Auger. \$ doz. \$10.00
Iwan's Perfection Post Hole Digger. \$ doz. \$10.00
Samson, 1/2 doz. \$36.00
Vaughan's Post Hole Auger. \$ doz. \$5.25

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—**

—See *Checks, Door.*

Door Springs—

—See *Springs, Door.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, 1/2 doz. \$18.00
No. 2, \$12.00; No. 3, \$11.00; No. 4, \$12.00

Drawing Knives—

—See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmith's Drill, each \$1.50
Bench Drills, Stearns'. 50¢
Blacksmith's Self-feeding, each \$7.50, 20¢
Breast, Millers' Falls, each \$3.00. 25¢
Broad, P. S. & W. 40¢
Goodell Automatic Drills. 40¢
Ratchet, Bignall & Keeler. 30¢
Ratchet, Curtis & Curtis. 25¢
Ratchet, Ingersoll's. 25¢
Ratchet, Parker's. 40¢
Ratchet, Weston's. 20¢
Ratchet, Whitney's. 20¢

Whitney's Hand Drill, No. 1, \$10.00;

Adjustable, No. 10, \$12.00. 35¢

Twist Drills—

Standard List. 60¢

Drill Bits or Bit Stock

Drills—See *Augers and Bits.*

Drill Chucks—See Chucks.**Dripping Pans—**

—See *Pans, Dripping.*

Drivers, Screw—

Balsey's Screw Holder and Driver, 1/2 doz. \$2.40
2 1/2 inch, \$5; 4 in., \$7.50
Buck Bros' Screw Drivers. 25¢
Buck Bros' Screw Driver Bits. 27¢
Champion. 40¢
Dixson's. 50¢
Douglas Mfg. Co. 20¢
Electric Spiral. 50¢
Elliott's Socket, No. 3, \$12.00. 50¢
Fray's Hol. H'dle Sets, No. 3, \$12.00. 50¢
Gay & Parsons' Ratchet. 35¢
Goodell's Automatic. 50¢
Hercules, W. & B. 70¢
Howard-Allard Spiral. 50¢
Jones Reversible. 50¢
Knapp & Cowles. 70¢
Nos. 1 and 2. 60¢
Nos. 3 and 4. 60¢
Nos. 4 and 60. Acme and Ideal. 60¢
Mayhew's Black Handle. 50¢
Mayhew's Monarch. 45¢
New England Specialty. 50¢
New York, Manhattan and Handy. 20¢
Sargent & Co.'s:
Nos. 1, 20, 40 and 60.50¢
Nos. 50 and 55. 50¢
Screw Driver Bits. 50¢
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles. 70¢
No. 88. 75¢
Syracuse Screw Driver Bits. 40¢

Egg Beaters—See Beaters, Egg.**Emery—No. 4 to No. 54 to Flour, CF**

Kegs, 1/2 doz. 40 gr. 1.80 gr. F.F.F.
1/4 kegs, 1/2 doz. 5¢
1/2 kegs, 1/2 doz. 5¢
10 lb cans, 10 6¢
In case. 6¢
10 lb cans, less than 10 10¢

Enameled and Tinned

Ware—See *Ware, Hollow.*

Escutcheon Pins—

—See *Pins, Escutcheon.*

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's. 50¢

Faucets—

B. & L. B. Co.:
West's Lock, Open and Shut Key 50¢
Burnside's Red Cedar. 50¢
Burnside's Red Cedar, bbl. lots. 50¢
Cork Lined. 70¢
Metallic Key, Leather Lined. 65¢
John Sommer's Peerless Tin Key. 50¢
John Sommer's Boss Tin Key. 50¢
John Sommer's No Brand Metal Key. 50¢
John Sommer's W. P. Metal Key. 40¢
John Sommer's Diamond Lock. 40¢
John Sommer's I. X. L. Cork Lined. 50¢
John Sommer's Reliable Cork Lined. 60¢
John Sommer's Common Cork Lined. 70¢
John Sommer's Chicago Cork Lined. 60¢
John Sommer's O. K. Cork Lined. 50¢
John Sommer's Perfection Cedar. 40¢
John Sommer's Cedar (in bbls.). 50¢
Star. 60¢
Stearns' Plug, new list. 40¢
Stearns' Wood, No. 200, Wood-lined Key. 50¢
Stearns' Matchless, Wood, No. 300. 60¢
Stearns' Gem, Wood, No. 400. 60¢
Lockport, Metal Plug, reduced list. 60¢
Self Measuring:
Enterprise, 1/2 doz. \$36.00
Lane's, 1/2 doz. \$36.00
National Measuring, 1/2 doz. \$36.00

Felloe Plates—

—See *Plates, Felloe.*

Fifth Wheels—

Brewster. 75¢
Derby and Cincinnati. 70¢

Files—Domestic—

Best Brands. 70¢
Good Brands. 75¢
Fair Brands. 80¢
Second Quality. 80¢

Imported—

Stubs' Tapers. Stubs' list, July 24, '97. 30¢

Fixtures, Grindstone—

Net prices:
Inch. 15 17 19 21 24
Per doz. \$2.50 2.50 2.75 3.25 4.50
Stowell's Grand Grindstone - Hanser. \$ doz. \$8.00
P. S. & W. Co. 50¢
Reading Hardware Co. 30¢
Sargent's Patent. 70¢

Fluting Machines—

—See *Machines, Fluting.*

Fodder Squeezers—

—See *Squeezers, Fodder.*

Forks—

Hay, 2 tine. 70¢
Hay, 3 tine. 70¢
Manure, 4 tine. 70¢
Manure, 5 and 6 tine. 70¢
Spading. 70¢
Victor, Hay. 60¢
Victor, Manure. 75¢
Victor, Header. 70¢
Champion, Hay. 70¢
Champion, Manure. 75¢
Columbia, Hay. 70¢
Columbia, Manure. 75¢
Columbia, Spading. 70¢
Hawkeye Wood Barley 4 tine 1/2 doz. \$5.00; 6 tine, \$5.50.
Plated see *Spoons.*

Frames—**Saw—**

Red, Polished and Varnished. \$ doz. \$1.00
White. \$ gro. \$8.25

Screens, Window and Door—

Bonanza Window Screens. 60¢
Flyer Window Screens. 50¢
Maine Window Screen Frames. 50¢
Perfection Window Screens. 60¢
Phillips' Window Screen Frames. 60¢
Porter's Extension Window Screens. 60¢
Stearns' Frames and Corners 25¢
Stearns' Monarch Adjustable Window Screens. 50¢
Stearns' Gem Window Screen Frames. 50¢
Wabash Adj. Window Screens. 50¢
Warner's Screen Corner Irons. 35¢

Freezers Ice Cream—

Qts. 2 3 4 6 8 10
Best. \$1.40 1.60 1.85 2.30 3.00 8.90
Good. \$1.30 1.40 1.70 2.10 2.70 8.60
Fair. \$1.10 1.20 1.40 1.85 2.40 8.00

Fruit and Jelly Presses—

—See *Presses, Fruit and Jelly.*

Fry Pans—See Pans, Fry.**Funnels—**

Gardorff's Perfection, Standard and Globe, 1 to 3 gr., 10¢; 3 to 5 gr., 20¢

Fuse—

Per 1000 feet.
Hemp Fuse. \$2.60
Cotton Fuse. 2.90
Single Taped Fuse. 3.50
Double Taped Fuse. 4.70
Triple Taped Fuse. 6.70

Gates, Molasses—

Stearns' Molasses and Oil. 30¢
Stebbin's. 30¢

Gauges—

Barrett's Comb. Roller Gauge. \$ doz. \$6.75
Marking, Mortise, &c. 60¢
Stanley R. & L. Co.'s Butt & Rabbit Gauge. 25¢
Wire, Brown & Sharpe's. 25¢
Wire, Morse's. 25¢
Wire, P. S. & W. Co. 10¢
Wire, Wheeler, Madden & Co. 10¢

Gimlets—

Nail, Metal, Assorted. \$ gr. \$2.80
Spike, M. tal, Assorted. \$ gr. \$4.40
Nail, Wood Handled, Ass'd. \$ gr. \$4.30
Spike, Wood Handled, Ass'd. \$ gr. \$4.90

Glue—

Le Page's Liquid, List A, 37¢; List B, 33¢; List C, 25¢

Glue Pots—See Pots, Glue.**Grease, Axle—**

Allerton's Axle:
12 Tins, 1/2 gr. \$9.00
30 Tins, 1/2 gr. \$3.00
25 lb wood pails. \$ doz. \$12.00
Dixon's Everlasting. 10¢
Dixon's Everlasting, in bxs. \$ doz. \$1.20
Lower grades, special brands. \$ gr. \$5.00

Grindstone Fixtures—

—See *Fixtures, Grindstone.*

Gun Powder—See Powder.**Hack Saws—See Saws.****Hafts, Awl—**

Peg Patent, Leather Top. \$ gr. \$4.90
Peg Patent, Flat Top. \$ gr. \$3.45
8-win. Brass Ferrule. \$ gr. \$1.50
Saddlers', Brass Ferrule. \$ gr. \$1.25
Peg, Common. \$ gr. \$1.25
Brad, Common. \$ gr. \$1.25

Halters and Ties—

Covert Mfg. Co., Web and Rope. 45¢
Covert's Saddlery Works, 90 list. 70¢

Hammers—**Handled Hammers—**

Heller's Machinists'. 40¢
Magnetic Tool, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75. 40¢
Peg, Stow & Wilcox. 40¢
Fayette R. Plumb:
Artisan's Choice, A. E. Nail. 40¢
Engineers' and B. S. Hand. 60¢
Machinists' Hammers. 60¢
A. E. & A. Bell Face Nail. 40¢
Other Nail Hammers. 50¢
Sargent's C. S. New List. 45¢

Heavy Hammers and Sledges—

8 lb and under..... \$ 45¢ 80&100
 8 to 5 lb..... \$ 36¢ 10&55
 Over 5 lb..... \$ 30¢ 10&55
 Wilkinson's Smiths..... \$ 16¢ 10&55

Handcuffs and Leg Irons

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins..... \$ 40¢
 Champion..... \$ 40¢
 Ely's Perfection..... \$ 30¢

Iron, Wrought or Cast—

Barn Door, \$ 1.40..... 80&100
 Bronze Iron Drop Latches..... \$ 60¢
 Chest, Sargent's list..... \$ 50¢ 10&100
 Door or Thumb..... \$ 1.00 1.00 1.35 1.50
 \$ doz..... \$ 0.90 1.00 1.35 1.50
 Jap'd Store Door Handles—Nuts, \$1.62;
 Plate, \$1.10; no plate, \$0.88..... 10¢
 Roggin's Latches..... \$ doz. 28¢ 30¢

Wood—

Auger, assorted..... \$ gr. \$2.25@2.50
 Auger, large..... \$ gr. \$2.75@3.00
 File, assorted..... \$ gr. \$1.25@1.40
 Brad Axl..... \$ gr. \$1.75@2.00
 Apple Firmer Chisel, ass'd..... \$ gr. 2.25@2.50
 Apple Firmer Chisel, large..... \$ gr. 2.75@3.00
 Hickory Firmer Chisel, ass'd..... \$ gr. 2.25@2.50
 Hickory Firmer Chisel, large..... \$ gr. 2.50@2.75
 Socket Firmer Chisel, ass'd..... \$ gr. 1.25@1.50
 Socket Framing Chisel, ass'd..... \$ gr. 2.50@2.75
 Hammer, Hatchet, Axe, &c..... \$ 50¢ 10¢
 Hoe, Rake and Fork..... \$ 60¢ 10¢
 Shovel and Spade, Wood D Handle, 60&100
 Hand Saw, Varinshed, \$ doz. 75¢ 80¢;
 not Varinshed..... \$ 55¢ 60¢
 Plane Handles:
 Jack, \$ doz. 23¢ 25¢; Jack Bolted..... \$ 55¢ 60¢
 Fore, \$ doz. 35¢ 38¢; Fore, Bolted..... \$ 70¢ 75¢

Hangers—

Barn Door, New Pattern, Round Groove,
 Regular..... \$ 3 4 5 6 8
 \$ doz..... \$1.28 1.68 2.16 2.64 3.36
 Barn Door, New England Pattern, Check
 Back, Round Groove, Regular..... \$ 3 4 5 6 8
 \$ doz..... \$2.90 3.74 4.84 6.16
 Bigelow & Moore Mfg. Co.:
 Paragon, No. 1, \$3.50; No. 2, \$4.50;
 No. 3, \$5.50 \$ doz.

Chicago Spring Butt Co.:
 Friction..... \$ 35¢ 35¢ 10¢
 Oscillating..... \$ 35¢ 35¢ 10¢
 Big Twin..... \$ 35¢ 35¢ 10¢
 Chisholm & Moore Mfg. Co.:
 Advance..... \$ 60¢ 10¢
 Cleveland..... \$ 60¢ 10¢
 Baggage Car Door..... \$ 50¢
 Elevator..... \$ 40¢
 Railroad..... \$ 55¢
 Cronk Hanger Co.:
 Roller Bearing..... \$ 70¢
 Steel Covered..... \$ 60¢ 10¢
 Lane Bros.:
 Parlor, Standard..... \$ 40¢ 10¢
 Barn Door, Standard..... \$ 60¢ 10¢
 Covered..... \$ 50¢ 10¢
 Cycle, \$ doz. \$12.00..... \$ 33¢ 35¢
 No. 50..... \$ 80¢ 5¢
 Parlor Door, New Model..... \$ 40¢ 5¢
 Lawrence Bros.:
 Crown..... \$ 60¢ 10¢
 New York..... \$ 60¢ 10¢ 60&100
 Sterling..... \$ 60¢ 10¢
 McKinney Mfg. Co.:
 No. 2, Standard, \$18..... \$ 60¢ 10¢
 No. 1, Special, \$13..... \$ 60¢ 10¢
 Payson Mfg. Co.:
 Pendulum, No. 638..... \$ 2.49

E. C. Stearns & Co.:
 Davis Parlor Door..... \$ 50¢ 50¢ 5¢
 Gem Parlor Sliding Door..... \$ 50¢ 50¢ 5¢
 Challenge..... \$ 50¢ 50¢ 5¢
 Steel Single Track Parlor, \$6..... \$ 50¢
 Royal Parlor Door..... \$ 50¢
 Warner's Pat..... \$ 20¢ 10¢ 10¢
 Warner's Imp'd Single..... \$ 40¢ 10¢
 Stowell Mfg. and Foundry Co.:
 Badger..... \$ 60¢ 10¢
 Baggage Car Door..... \$ 33¢ 35¢
 Climax Anti-Friction..... \$ 55¢ 5¢
 Elevator..... \$ 40¢
 Interstate..... \$ 60¢ 10¢
 Magic..... \$ 50¢ 10¢
 Matchless..... \$ 60¢ 10¢
 Nansen..... \$ 60¢ 10¢
 Parlor Door..... \$ 50¢ 10¢
 Railroad..... \$ 55¢ 5¢
 Street Car Door..... \$ 50¢ 10¢
 Steel, Nos. 300, 400, 500..... \$ 45¢ 15¢
 Wild West..... \$ 50¢ 5¢
 Zenith for Wood Tracks..... \$ 55¢ 5¢
 Taylor & Boggs Foundry Co.:
 Kidder's..... \$ 50¢ 50¢ 10¢
 Terry Mfg. Co.:
 Ideal..... \$ 70¢
 Modern..... \$ 70¢
 Modern, Covered..... \$ 70¢
 Safety..... \$ 70¢
 Shield..... \$ 70¢
 Solid..... \$ 70¢
 Wrought..... \$ 70¢
 Van Wagoner & Williams Hdw. Co.:
 American Trackless..... \$ 33¢ 35¢ 10¢
 Wilcox Mfg. Co.:
 Aurora Steel Endless..... \$ 60¢
 Bike Roller Bearing..... \$ 60¢ 10¢ 10¢
 Bike Steel Endless..... \$ 60¢ 10¢ 10¢
 C. J. Roller Bearing..... \$ 60¢ 10¢ 10¢
 Cycle Ball Bearing..... \$ 60¢ 10¢
 Dye Steel..... \$ 60¢ 10¢
 Economical Single Track..... \$ 50¢ 10¢ 5¢
 L. T. Roller Bearing..... \$ 70¢
 New Era..... \$ 50¢ 10¢
 New Richards..... \$ 60¢
 O. K. Roller Bearing..... \$ 70¢
 Prindle Improved..... \$ 60¢ 10¢
 Richards' Improved..... \$ 60¢ 10¢
 Richards' Single Track..... \$ 50¢ 10¢
 Wilcox Dwarf Roller Bearing..... \$ 40¢ 10¢
 Wilcox-Ives..... \$ 60¢ 10¢
 Wilcox Tandem Roller Bearing..... \$ 60¢ 10¢
 Wilcox Trolley Ball Bearing..... \$ 40¢ 10¢
 Wilcox Trolley Roller Bearing..... \$ 50¢
 Wilcox Trolley Roller Bearing..... \$ 40¢ 10¢
 Fire..... \$ 40¢ 10¢
 Wood Track..... \$ 60¢

Harness Menders—See

Menders.

Harness Snaps—See Snaps.**Hasps—**

McKinney's Perfect Hasp, \$ doz. \$1.10
 40&100
 Wrought Hasps, Staples, &c.—See
 Wrought Goods.

Hatchets—

Blood's, Hunt's, Plumb's, Underhill's,
 etc..... \$ 40¢ 12¢ 50¢ 55¢
 Cheaper Brands..... \$ 50¢ 10¢ 60¢

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Clark Mfg. Co.:
 No. 1 Blind Hinge, Old Pattern..... \$ 80¢ 10¢ 5¢
 "Special"..... \$ 80¢ 10¢ 5¢
 No. 1 Blind Hinge, "Diamond" (with
 tip)..... \$ 80¢ 10¢ 5¢
 No. 1 Blind Hinge "Cottage" (with
 tip)..... \$ 80¢ 10¢ 10¢
 Nos. 1, 3, 5 Blind Hinges, regular
 1088 old Pattern..... \$ 80¢ 10¢
 Nos. 1, 3, 5 Blind Hinges, "Victor"
 (with double tip)..... \$ 80¢ 10¢
 No. 50 Blind Hinge, both "Noiseless"
 and "Empire"..... \$ 80¢
 No. 40—60—85 Blind..... \$ 80¢
 Lull & Porter Old Style Shutter..... \$ 80¢ 10¢
 Dixie, L. & P. Shutter..... \$ 80¢ 10¢
 Buffalo Reversible Shutter..... \$ 80¢ 10¢
 Mortise Gravity Blind..... \$ 50¢
 Parker..... \$ 75¢ 10¢ 75¢ 10¢ 5¢
 North's Automatic Blind Fixtures, No. 2,
 for Wood, \$9.00; No. 3, for Brick,
 \$11.50..... \$ 10¢
 Reading's Gravity..... \$ 75¢ 10¢
 Sargent's, Nos. 1, 3, 5, 11, 13, 75¢ 10¢
 Wrightville H'dware Co.:
 Acme, Lull & Porter..... \$ 80¢ 10¢
 Buffalo Gravity Locking, Nos. 1, 3
 and 5..... \$ 80¢ 10¢ 5¢
 Champion Gravity Locking, No. 75..... \$ 80¢ 10¢ 5¢
 1868, Old Pat'n, Nos. 1, 3 & 5..... \$ 80¢ 10¢ 5¢
 Tip Pattern, Nos. 1, 3 and 5..... \$ 80¢ 10¢ 5¢
 Double Locking, Nos. 20 and 25..... \$ 75¢
 Empire, Nos. 101 and 103..... \$ 80¢
 Niagara Gravity Locking, Nos. 1, 3
 and 5..... \$ 80¢ 10¢
 Noiseless, Nos. 50, 60, 65 and 55..... \$ 80¢
 O. S. Lull & Porter..... \$ 70¢ 10¢ 5¢
 Pioneer, Nos. 060, 46 and 54..... \$ 75¢ 5¢
 Steamboat Gravity Locking, No. 10..... \$ 80¢ 10¢ 5¢
 Stanley's Steel Gravity Blind Hinges,
 \$ doz. sets \$1.30..... \$ 40¢ 10¢

Gate Hinges—

Reversible Self-Closing, with Lat'h..... \$ doz. \$1.70@1.75
 Western, with Lat'h..... \$ doz. \$1.25@1.35
 New England, with Lat'h..... \$ doz. \$1.45@1.50
 Reversible Self-Closing, without Lat'h..... \$ doz. \$1.30@1.35
 Western, without Lat'h..... \$ doz. \$0.75@0.78
 New England, without Lat'h..... \$ doz. \$1.00@1.05

Spring Hinges—

J. Bardsley:
 Bardsley's Patent Checking..... \$ 15¢
 Bommer brot..... \$ 40¢
 Bommer's..... \$ 40¢
 Chicago Spring Butt Co.:
 Chicago..... \$ 30¢
 Garden City Engine House..... \$ 30¢
 Keene's Saloon Door..... \$ 30¢
 Lawson Mfg. Co.:
 Matchless..... \$ 25¢
 Matchless Pivot..... \$ 40¢
 Payson Mfg. Co.:
 Oblique, Dbl. Acting..... \$ 60¢ 50¢ 5¢
 E. C. Stearns & Co.:
 Nos. 45 and 51..... \$ 70¢
 Stover Mfg. Co.:
 Ideal, No. 16, Detachable, \$ gr. \$2.50
 Ideal, No. 4..... \$ gr. \$9.00
 New Idea No. 1..... \$ gr. \$9.00
 New Idea, Double Acting..... \$ 45¢
 Van Wagoner & Williams Hdw. Co.:
 Acme..... \$ 30¢ 3¢
 Columbia, No. 14..... \$ gr. \$8.00
 Columbia, No. 18..... \$ gr. \$24.00
 Crown..... \$ 30¢
 Gem..... \$ 30¢
 Knoxall..... \$ gr. \$9.00
 Oxford..... \$ 30¢

Wrought Iron Hinges—

Strap and 1 Hinges, &c., list Mar. 15, 1893:
 Light Strap Hinges..... \$ 75, 10¢ 5¢
 Heavy Strap Hinges..... \$ 80¢ 10¢
 Light T Hinges..... \$ 75, 20¢ 25¢
 Heavy T Hinges..... \$ 75¢ 5¢
 Extra Heavy T Hinges..... \$ 80¢
 Plate Hinges..... \$ 6 to 12 in. \$ 2 5¢
 Providence..... \$ 14 to 36 in. \$ 2 5¢
 Rolled Blind Hinges, Nos. 32 and 34..... \$ 50¢ 10¢ 50¢ 10¢ 5¢
 Rolled Plate..... \$ 70¢ 10¢ 70¢ 10¢ 5¢
 Screw Hook..... \$ 6 to 12 in. \$ 2 5¢
 and Strap..... \$ 14 to 36 in. \$ 2 5¢
 Screw Hook and Eye:
 3/4 to 1 in. diam..... \$ 4 5¢ 4 5¢
 5/8 in. diam..... \$ 5 5¢ 5 5¢
 3/4 in. diam..... \$ 7 5¢ 7 5¢

Hoes—**Eye—**

D. & H. Scovill..... \$ 95¢ 35¢ 5¢
 Scovill and Oval Pattern..... \$ 80¢ 80¢ 10¢
 Grub, list Feb. 25, 1899..... \$ 70¢ 10¢ 75¢

Handled—

Field and Garden..... \$ 60¢ 40¢ 55¢ 2¢
 Ladies' Boys' Toy and Onion..... \$ 75¢ 15¢ 2¢
 Street and Mortar..... \$ 75¢ 15¢ 2¢
 Cotton..... \$ 75¢ 10¢ 2¢ 2¢
 Planters..... \$ 75¢ 10¢ 2¢ 2¢
 Weeding..... \$ 75¢ 10¢ 5¢ 2¢
 Ft. Madison Crucible Garden Hoe..... \$ 75¢ 10¢ 3¢
 Ft. Madison Crescent Cultivator Hoe..... \$ 23.75
 per doz..... \$ 4.00
 Ft. Madison Mattock Hoe, \$ doz..... \$ 4.00
 Ft. Madison Sprouting Hoe, \$ doz..... \$ 4.50
 Ft. Madison Dixie Tobacco Hoe..... \$ 75¢ 10¢ 2¢
 Kretzinger's Cut Easy, per doz..... \$ 4.50
 Warren Hoe..... \$ 60¢ 10¢

Hog Rings and Ringers—

See Rings and Ringers.

Hoisting Apparatus—

See Machines, Hoisting.

Hollow Ware—

See Ware, Hollow.

Holders—Bag—

Sensible Bag and Twine..... \$ 50¢

Bit—

Angular, \$ doz. \$24.00..... \$ 45¢ 10¢
 Extension..... \$ 45¢ 10¢
 Barber's, \$ doz. \$15.00..... \$ 45¢ 10¢

File and Tool—

Nicholson File Holders and File Hand-
 les..... \$ 38¢ 4¢

Hooks—**Cast Iron—**

Bird Cage, Reading..... \$ 60¢ 10¢ 10¢
 Bird Cage, Sargent's List..... \$ 70¢
 Clothes Line, Sargent's List..... \$ 50¢ 10¢
 Ceiling, Sargent's List..... \$ 50¢ 10¢
 Clothes Line, Stowell's..... \$ 70¢ 5¢
 Clothes Line, Reading List..... \$ 65¢ 10¢ 65¢ 10¢ 10¢
 Coat and Hat, Stowell's..... \$ 70¢ 5¢
 Coat and Hat, Reading..... \$ 60¢ 10¢ 10¢
 Coat and Hat, Sargent's List..... \$ 50¢ 10¢
 Coat and Hat, Wrightville list..... \$ 70¢ 10¢
 Harness, Reading List..... \$ 70¢ 10¢ 75¢

Wire—

Atlas, Coat and Hat..... \$ 50¢ 50¢ 10¢
 Belt..... \$ 80¢ 10¢ 80¢ 20¢
 Buffalo Belt Fasteners..... \$ 40¢
 Wire Coat and Hat:
 Acme..... \$ 60¢ 60¢ 5¢
 B..... \$ 70¢ 70¢ 5¢
 Gem..... \$ 60¢ 5¢
 Bright Wire Goods—See Wire.

Wrought Iron—

Box, or Case, Octa on Steel..... \$ doz. \$2.00@2.15
 Cotton..... \$ doz. \$1.00@1.10
 Picture, T. & S. Mfg. Co..... \$ 75¢
 Tassel, T. & S. Mfg. Co..... \$ 50¢ 10¢
 Wrought Staples, Hooks, &c..... \$ See Wrought Goods.

Miscellaneous—

Bush, Light, \$ doz. \$5.00; Medium,
 \$5.50; Heavy, \$6.00
 Covert Saddlery Wor-s' Self Locking
 Gate and Door Hook, 4 in. \$ gross
 \$13.00; 6 in. \$17.20..... \$ 70¢
 Crown Picture..... \$ 60¢
 Fish Hooks, American..... \$ 60¢ 60¢ 10¢
 Grass, No. 2, \$1.65; No. 3, \$1.80; No.
 4..... \$ 2.00
 Potato and Maize..... \$ 75¢ 15¢
 Hooks and Eyes—Brass..... \$ 70¢ 10¢ 75¢
 Hooks and Eyes—Malleable Iron..... \$ 75¢ 10¢
 Whiffletree..... \$ 45¢
 Bench Hooks—See Bench Stops.
 Corn Hooks—See Knives, Corn.

Horse Nails—See Nails, Horse.**Horseshoes—**

See Shoes, Horse.

Hose, Rubber—

Garden Hose, 3/4 inch:
 Competition..... \$ ft. 4@4 1/2¢
 3-ply Standard..... \$ ft. 5 1/2¢
 4-ply Standard..... \$ ft. 6 1/2¢
 3-ply extra..... \$ ft. 6 1/2¢
 4-ply extra..... \$ ft. 7 1/2¢
 High Grade..... \$ ft. 8 1/2¢ 9 1/2¢
 Cotton Garden, 3/4 in., coupled:
 Fair quality..... \$ ft. 7¢
 Good quality..... \$ ft. 8¢

Irons—**Sad—**

From 4 to 10..... \$ 2@2 1/2¢
 B. B. Sad Irons..... \$ 2 1/2¢ 2 1/2¢
 Chinese Laundry..... \$ 2 1/2¢ 3 1/2¢
 Chinese Sad..... \$ 2 1/2¢
 Crown Improved, Pol., \$ doz. \$5.50;
 Nickel, \$7.00
 Troy Pol. Irons..... \$ doz. \$3.00
 Mrs. Potts' set:
 No. 50..... \$ 60
 61@64..... \$ 71@74¢ 67¢ 70¢
 New England Pressing..... \$ 2 1/2¢ 3 1/2¢
 Sensible Sad Irons, Pol., \$ doz. \$6.50;
 Nickel, \$7.00.

Soldering—

Soldering Coppers..... \$ 21@25¢
 Covert Mfg. Co..... \$ 35¢ 2¢

Pinking—

Pinking Irons..... \$ doz. 55¢ 60¢

Jack Screws—See Screws.**Jacks, Wagon—**

Covert Mfg. Co., Steel..... \$ 45¢ 2¢
 Daisy, \$ doz. \$12.00..... \$ 70¢
 Lockport..... \$ 40¢ 40¢ 10¢
 Victor, \$ doz. \$20.00..... \$ 70¢
 Lane's Steel..... \$ 30¢

Kettles—

Brass, Spun, Plain, list Jan. 10, '99, 15¢ 20¢
 Enameled and Tea—See Ware, Hollow.

Knife Sharpeners—

See Sharpeners, Knife.

Knives—**Butcher, Shoe, &c.—**

Dick's Butcher Knives..... \$ 40¢
 Foster Bros.' Butcher, &c..... \$ 40¢
 Nichols' Butcher Knives..... \$ 50¢
 Table and Pocket Cutlery and John Wil-
 son's Butcher Knives—Net prices.
 Hay and Straw—See Hay Knives.

Corn—

Ft. Madison Cut-Easy, \$ doz. \$3.25

Drawing—

Standard list..... \$ 75¢ 10¢ 80¢
 Adjustable Handle..... \$ 25¢ 33¢ 1/2¢
 Bradley's..... \$ 35¢
 Douglass..... \$ 75¢ 75¢ 10¢
 Watrous..... \$ 30¢ 10¢ 40¢
 L. & J. J. White..... \$ 20¢ 5¢ 25¢
 Cautelo's Folding..... \$ 50¢ 50¢ 25¢

Hay and Straw—

Blizzard..... \$ 5.50@6.00
 Iwan's Sickle Edge..... \$ doz. \$10.50
 Lightning, from Jobbers..... \$ 5.00@6.00

Mincing—

Buffalo Adjustable, \$ doz. \$8.00..... \$ 40¢
 Knapp & Cowles..... \$ 60¢
 Smith's, \$ doz. Single, \$2; Double, \$3
 45¢ 50¢
 Sensible, Nos. 10, 20, 40 and 60..... \$

Miscellaneous—

Farriers'..... \$ doz. \$2.00@3.00

Knobs—

Base, 2 1/4 in., Birch, Rubber tip, \$ gro.
 \$1.25@1.40
 Bardsley's Wood Door, Shutter, &c..... \$ 15¢
 Carriage, Jap., \$ gr. 80¢..... \$ 60¢ 10¢
 Door, Mineral..... \$ doz. 60¢ 62¢
 Door, Por. Jap'd..... \$ doz. 65¢ 67¢
 Door, Por. Nickel..... \$ doz. \$1.70@1.80
 Drawer, Porcelain..... \$ 60¢ 10¢ 60¢ 10¢ 10¢
 Tassel, T. & S. Mfg. Co..... \$ 70¢ 10¢
 Shutter, Porcelain..... \$ 70¢ 70¢ 10¢
 Yale & Towne Wood, list Dec., '95..... \$ 40¢

Ladies—Melting—

P. S. & W..... \$ 35¢ 10¢ 40¢
 Reading..... \$ 50¢ 10¢
 Sargent's..... \$ 80¢ 80¢ 10¢

Lanterns—Tubular—

Regular Tubular..... \$ 7.00 40¢ 5¢ 40¢
 Side Lift Tubular..... \$ 7.50 10¢ 5¢
 Square Lift Tubular..... \$ 7.50

Bull's Eye Police—

2 1/2-inch flash light..... \$ doz. \$4.00
 3-inch flash light..... \$ doz. \$5.50
 2 1/2-inch regular..... \$ doz. \$3.50
 3-inch regular..... \$ doz. \$3.90

Lawn Mowers—

See Mowers, Lawn.

Leaders, Cattle—

Covert Mfg. Co..... \$ 45¢ 2¢
 Peck, Stow & W. Co..... \$ 60¢ 10¢
 Sargent's..... \$ 70¢ 10¢ 70¢ 10¢ 10¢

Lemon Squeezers—

See Squeezers, Lemon.

Lifters, Transom—

Excelsior..... \$ 60¢ 60¢ 10¢
 Payson's:
 Solid grip Nos. 303 and 304, \$ 100
 Other sizes..... \$ 70¢ 10¢
 Shaw's..... \$ 60¢ 60¢ 10¢

Lines—

Ossawa Mills.
 Crown Solid Braided Chalk..... \$ 85¢ 4¢
 Mason's, No. 0 to No. 3..... \$ 35¢ 4¢
 Silver Lake Braided Chalk, No. 0..... \$ 60¢
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
 \$ gr. \$7.50
 Wire Clothes, Nos. 18 19 20
 100 feet..... \$ 2.40 2.15 1.90
 75 feet..... \$ 1.35

Locks, &c.—Cabinet—

Cabinet Locks..... \$ 31¢ 2¢ 3¢

Door Locks, Latches, &c.

[Not prices are very often made on these goods.]
 Plate.....33½¢
 Reading.....60¢@60½¢
 R. & E. Mfg. Co.....60¢@10¢
 Sargent & Co.....30¢@10¢@10½¢
 S. B. & Co., Locks, Knobs, &c. 40¢@40½¢

Elevator—

Stowell's.....33½¢

Padlocks—

Wrought Iron, list Dec. 3, '97, 75¢@10¢
 Dog Collar, S. B. Co.....40¢
 E. T. Frain:
 Cast Iron, Scandinavian.....90¢@10¢
 Mal. Iron, 120 line.....90¢@10¢
 Mal. Iron, 110 and 125 line.....65¢
 All others.....50¢@55¢
 Scandinavian.....90¢@10¢@10½¢
 S. B. & Co.....40¢

Sash, &c.—

Fitch's Patent.....65¢@10¢
 Ives' Patent.....65¢@10¢
 Payson's Perfect.....70¢
 Payson's Signal.....70¢@10¢
 Reading.....60¢@10¢@70¢

Machines—**Boring—**

Without Augers.
 Upright. Angular.
 Boss, Carpenters', \$3.50
 Boss, Ship Builders', 3.75
 Douglas.....2.50 \$3.00
 Jennings.....2.50 3.00
 Millers' Falls.....2.50 3.00
 Enell's, Rice's Pat. 2.50 3.75

Fluting—

Crown Jewel, 6 in.....\$2.50@2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30¢
 Moore's Hand Hoist, with Lock Brake, 20¢
 Maris & Beckley (Teal Patent).....30¢
 See also Blocks.

Washing—

Wayne American, No. 2, \$27.50
 Western Star, No. 2, \$27.50
 Western Star, No. 3, \$30.00
 St. Louis, No. 41, \$68.00
 Carload 10¢ off, freight add.

Mallets—

Hickory.....50¢@50½¢
 Lignumvite.....50¢@50½¢
 Tinner's, Hickory and Applewood.....55¢@55½¢
 Fiber Head, Stearns'.....25¢

Mattocks—

List Feb. 23, 1899.....70¢@10¢@75¢

Measures—

Peck and Half Peck, See *Ware, Stand and Fiber*.

Meat Cutters—

See *Cutters, Meat*.

Menders—

Centaur Harness Menders, \$ doz.
 \$8.00
 Jones' Hose Menders, \$ doz., ½ in., 40¢
 ½ in., 50¢; 1 in., 85¢
 Victor Complete Hose Menders, \$ doz. \$3.50

Milk Cans—See Cans, Milk.**Mills—Coffee—**

Box and Side, list Jan. 1, '88.....60¢@10¢@60½¢
 Net prices are often made on some goods which are lower than above discounts.
 Enterprise Mfg. Co., list Jan. 17, '93.....30¢
 National, list Jan. 1, '94.....30¢
 Parker's Columbia and Victor.....60¢@10¢
 Parker's Upright.....30¢@10¢
 Swift, Lane Bros.....35¢

Mincing Knives—

See *Knives, Mincing*.

Molasses Gates—

See *Gates, Molasses*.

Money Drawers—

See *Drawers, Money*.

Mowers, Lawn—

Net prices are very frequently quoted
 10 12 14 16-inch
 Cheap.....\$1.05 \$1.70 \$1.75 \$1.80
 Medium.....2.50 2.75 3.00 3.25
 High grade.....3.50 3.75 4.00 4.25
 Pennsylvania and Continental.....60¢@10¢

Philadelphia:

All Styles except A and E.....70¢@10¢
 Style A, all Steel.....60¢@10¢
 Style E, Low Wheel.....60¢@10¢
 Style E, High Wheel.....60¢@10¢
 Racine.....60¢@10¢@10½¢

Muzzles—

Safety.....\$ gr. \$12.00@13.50

Nails—

Cut and Wire. See *Trade Report*.
 Wire Nails and Brads, Papered. List,
 May 1, '92.....See *Trade Report*.
 Hungarian, Finishing, Upholsterers, &c.
 See *Tacks*.

Horse—

Nos. 6 7 8 9 10
 A. C.....25¢ 23¢ 22¢ 21¢ 21¢
 American.....9½ 9¼ 9¼ 9¼ 9½ net
 Ausable.....28¢ 26¢ 25¢ 24¢ 23¢
 Capewell.....19¢ 18¢ 17¢ 16¢ 15¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢
 Clinton Fin.....19¢ 17¢ 16¢ 15¢ 14¢
 Maud S.....25¢ 23¢ 22¢ 21¢ 21¢
 Neponset.....23¢ 21¢ 20¢ 19¢ 18¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢

Picture—

Brass Head, Combination list.....50¢@10¢
 Brass Head, Sargent's list.....70¢@10¢@10½¢
 Porcelain Head, Combination list.....40¢@10¢
 Porcelain Head, Sargent's list.....50¢@10¢
 Crown.....50¢@10¢
 Niles' Patent.....40¢

Nippers, See Pliers and Nippers.**Nut Crackers—**

See *Crackers, Nut*.

Nuts—List Dec. 18, 1898.

Cold Punched. Off list.
 Mfrs. or U. S. Standard.
 Hexagon, plain.....\$6.50
 Square, plain.....6.10
 Square, C. T. & R.....6.20
 Hexagon, C. T. & R.....7.10
 Hot Pressed.
 Mfrs., U. S. or Nar. Gauge Standard.
 Square.....\$6.40
 Hexagon.....7.20

Oakum—

Best or Government.....\$ 53¢
 Navy.....43¢
 U. S. Navy.....54¢
 Plumbers' Spun Navy.....54¢
 F. & B. New York. In carload lots \$4¢ off.

Oil Tanks—See Tanks, Oil.**Oilers—**

Brass and Copper.....50¢@10¢@60¢
 Zinc and Tin.....75¢@75½¢
 Malleable, Hammers' Improved, No. 1
 \$3.60; No. 2, \$4; No. 3, \$4.40
 Malleable, Hammers' Old Pattern, same list.
 Wilcox & Hobbs Mfg. Co.....70¢@10¢@75¢

Openers, Can—

French.....\$ doz. 35¢
 Iron Handle.....\$ doz. 60¢@75¢
 Kio-dike, C. Rogers & Bros., \$ gro. \$6.50
 National, \$ gro.....\$1.75@2.00
 Sardinia Solars.....\$ doz. \$2.00@2.10
 Sprague, Iron or Wood Handles.....\$ doz. 40¢@45¢
 Stowell's.....75¢@10¢
 Stroeter's:
 Sensible, Japanned.....\$ gr. \$3.50
 Sensible, Nickel.....\$ gr. \$5.50
 Surprise.....\$ gr. \$2.00
 New Sprague, Metallic H'dle.....\$ gr. \$3.50
 New Sprague, Wood H'dle.....\$ gr. \$4.50

Packing—**Rubber—**

Standard, fair quality.....70¢@10¢@75¢
 Inferior quality.....75¢@10¢@80¢
 Extra.....60¢@50¢@10¢@55¢
 Jenkins' Standard, \$ 80¢.....25¢@25½¢

Miscellaneous—

American Packing.....9¢ @ 10¢ @ 11¢
 Cotton Packing.....13¢ @ 14¢ @ 15¢
 Italian Packing.....10¢ @ 11¢ @ 12¢
 Jute.....9¢ @ 10¢ @ 11¢
 Russia Packing.....12¢ @ 13¢ @ 14¢

Pails—**Creamery—**

S. B. & Co., with gauges. No. 1 \$5.25;
 No. 2, \$5.50 \$ doz.....15¢

Galvanized—

Inch.....10 12 14
 Water, Standard.....\$10.50 \$18.50 \$20.50
 Water, Competit.....\$14.00 \$18.00 \$20.00
 Fire, \$ gro.....\$19.00 \$22.50 \$25.50
 Well, \$ gro.....\$21.00 \$22.00 \$25.00

Pans—**Dripping—**

Large Sizes.....\$ 3¢ @ 3½¢
 Small sizes.....\$ 4¢ @ 4½¢

Fry—

Standard List.....80¢@80½¢
 No.....0 1 2 3
 \$ doz. \$3.00 \$3.75 \$4.25 \$5.25
 No.....0 1 2 3
 \$ doz. \$6.00 \$7.00 \$8.00 \$9.00
 Acme Fry Pans.....75¢@75½¢

Roasting and Baking—

Columbian, S. S. & Co., Nos. 5, \$ doz.
 \$10; 10, \$11.50; 20, \$13; 30, \$15.....80¢
 Simplex No. 08, \$ doz. \$7.00; No. 09,
 \$8.50.....60¢

Paper—**Building Paper—**

Per roll
 Rosin Sized Sheathing.....500 sq. ft.
 Light wt., 20 sq. ft. to lb.....\$0.35@0.40
 Medium wt., 12 sq. ft. to lb.....\$0.55@0.60
 Heavy wt., extra quality.....\$0.95@1.05
 Barrett's Water Proof Sheathing.....\$1.25@1.75
 Medium Grades Water Proof sheath-
 ing.....\$0.80 to 1.25
 Deafening Felt, 6 and 4½ sq. ft. to
 lb., \$ ton.....\$42.50

Tarred Paper.

1 ply (roll 300 sq. ft.), \$ ton.....\$35@37
 2 ply, heavy, \$ roll 100 sq. ft.....90¢
 2 ply, light, \$ roll 100 sq. ft.....75¢
 3 ply, heavy, \$ roll 100 sq. ft.....\$1.20
 3 ply, light, \$ roll 100 sq. ft.....\$1.00

Sand and Emery—

List April 19, 1888.....50¢@10¢@50¢

Parers—**Apple—**

Advance.....\$ doz. \$4.50
 Baldwin.....\$ doz. \$5.00
 Bonanza.....each \$5.00
 Dandy.....each \$7.50
 Eureka, 1888.....each \$16.00
 Family Bay State.....\$ doz. \$12.00
 Hudson's Little Star.....\$ doz. \$4.00
 Hudson's No. 1 King table.....\$ doz. \$5.50
 Improved Bay State \$ doz. \$7.00@30.00
 New Lightning.....\$ doz. \$5.50
 Penn.....\$ doz. \$4.75
 Perfection.....\$ doz. \$4.00
 Reading 72.....\$ doz. \$4.00
 Reading 78.....\$ doz. \$7.00
 Turn Table.....\$ doz. \$4.50
 White Mountain.....\$ doz. \$4.00

Potato—

Saratoga.....\$ doz. \$5.50
 White Mountain.....\$ doz. \$4.50

Paris Green—

Arsenic kegs or casks.....\$ 12¢
 Kegs of 100 to 175 pounds.....\$ 12¢
 Kegs of 14, 25 and 50 pounds.....\$ 13¢
 Paper boxes 2 to 5 pounds.....\$ 13¢
 Paper boxes 1 pound.....\$ 14¢
 Paper boxes ½ pound.....\$ 15¢
 Paper boxes ¼ pound.....\$ 16¢

Picks and Mattocks—

List Feb. 23, 1899.....70¢@10¢@75¢

Pinking Irons—

See *Irons, Pinking*.

Pins—**Bow—**

1½-inch.....\$ gro. \$4.50@5.50
 2-inch.....\$ gro. \$5.00@5.50

Escutcheon—

Brass.....70¢@70½¢
 Iron, list Nov. 11, '85.....60¢@60½¢

Pipe, Cast Iron Soil—

Factory Shipments.

Standard.....75¢@75½¢
 Extra Heavy.....75¢@80¢
 Fittings.....80¢@80½¢

Pipe, Wrought—

Factory Shipments.

List February, 1899.
 Plain and Galva sized.....60¢@60½¢
 Screw and Socket Casing.....57½¢@10¢
 Inserted joint casing.....57½¢
 Cold Drawn Seamless Steel Tubing.....60¢

Planes and Plane Irons—**Wood Planes—**

Molding.....45¢@45½¢
 Bench, First quality.....50¢@50½¢
 Bench, Second quality.....50¢@50½¢
 Bailey's (Stanley R. & L. Co.)
 50¢@10¢@50¢@10¢@10½¢

Iron Planes—

Bailey's (Stanley R. & L. Co.)
 50¢@10¢@50¢@10¢@10½¢
 Chaplin's Iron Planes.....50¢@10¢
 Miscellaneous Planes (Stanley R. & L.
 Co.).....25¢@10¢@50¢@10¢@10½¢
 Sargent's.....60¢@10¢@70¢

Plane Irons—

Standard List.....30¢@10¢@30¢@10¢@10½¢
 Auburn Thistle.....30¢@10¢@30¢@10¢@10½¢
 Buck Bros.....\$5.00@5.25 to 5
 Butcher's.....50¢@10¢@50¢@10¢@10½¢
 Stanley R. & L. Co.....50¢@10¢@50¢@10¢@10½¢
 L. & J. White.....20¢@5¢@25¢

Plates—

Felice.....\$ 6¢ @ 6½¢
 Self-Sealing Pie Plates (S. S. & Co.), \$
 doz. \$2.00.....50¢

Pliers and Nippers—

Acme Nippers.....50¢
 Bernard's:
 Parallel Pliers, &c.....33½¢
 Paragon Pliers.....50¢
 Lodi Pliers.....50¢
 Elm City Pease Pliers.....35¢
 Button's.....70¢@10¢@70¢@10¢@50¢
 Cronk's Patent Pliers.....60¢
 Cronk's Stub's Pat. Pliers.....50¢@10¢

Cronk's Button Pattern.....70

Cronk's Combs, Cutting and Gas Pliers,
 \$ doz. \$20.00, 40¢

Gas Pliers, \$ doz.:

Best.....7-in. 8-in. 9-in. 10-in.
 Good.....\$2.50 2.75 3.00 3.50
 Heller's Farmers' Pincers and Fools.....40¢@40½¢

Morrill's Parallel, \$ doz. \$12.00.....30¢@55¢
 P. S. & W. Cast Steel.....50¢@50½¢
 P. S. & W. Tinner's Cutting Nippers,
 add 6¢.....10¢

Utica Drop Forge & Tool Co.:
 Combination Pliers.....40¢@55¢
 Side Cutting Pliers.....40¢@55¢
 Hall Patent Nipper.....40¢@55¢
 Round and Flat Nose Pliers.....40¢@55¢
 End Cutting Pliers.....40¢@55¢
 Royal Blue.....40¢@55¢
 Glass Pliers.....40¢@55¢
 Burner Pliers.....40¢@55¢

Plumbs and Levels—

Plumbs and Levels.....70¢@10¢@70¢@10¢@10½¢
 Cook's.....40¢@10¢@40¢@10¢@10½¢
 Pocket Levels.....70¢@10¢@75¢@10¢
 Stanley R. & L. Co.
 70¢@10¢@10¢@70¢@10¢@10½¢
 Stanley's Duplex.....25¢@10¢@25¢@10¢@10½¢
 Woods' Extension.....83½¢

Poachers, Egg—

Buffalo Steam Egg Poachers, \$ doz.
 No. 1, \$4.00; No. 2, \$9.00; No. 3, \$9.00;
 No. 4, \$12.00.....50¢

Points, Glaziers'—

Bulk and 1 lb papers.....\$ 11½¢
 ½ lb papers.....\$ 12¢
 ¼ lb papers.....\$ 12½¢

Pokes, Animal—

Bishop's American.....\$ doz. \$2.75
 Bishop's I. X. L.....\$ doz. \$5.50
 Bishop's Steel Monarch.....\$ doz. \$4.25
 Bishop's Pioneer.....\$ doz. \$3.25
 Ft. Madison Hawk.....\$ doz. \$3.00
 Ft. Madison, Western.....\$ doz. \$3.50
 Ironclad, Sunbury, with strap, \$ doz.
 \$4.25
 Ironclad, Sunbury, with snap, \$ doz.
 \$4.00
 Metallic Horse Poke.....\$ doz. \$5.00

Police Goods—

Bean's.....25¢
 Tower's.....25¢

Polish—Metal—

Prestoline Liquid, No. 1 (½ qt.), \$ doz.
 \$3.00; No. 2 (1 qt.), \$9.72.....40¢
 Prestoline Paste.....33½¢@40¢
 U. S. Metal Polish Paste, 3 oz. boxes, \$
 doz. 50¢; \$ gr. \$4.50; ½ doz. boxes, \$
 doz. \$1.25; 1 doz. boxes, \$ doz. \$2.25
 U. S. Liquid, 8 oz. cans, \$ doz. \$1.25;
 \$ gr. \$12.00
 Barker's Friend Metal Polish, \$ doz.
 \$1.75; \$ gr. \$18.00
 Wynn's White Silk, ½ pt. cans, \$ doz. \$1.50

Stove—

Joseph Dixon's, \$ gr. \$5.75.....10¢
 Dixon's Plumbago.....\$ 8¢
 Fireside.....\$ gr. \$2.50
 Gem, \$ gr. \$4.50.....10¢
 Japanese.....\$ gr. \$3.50
 Jet Black.....\$ gr. \$3.50
 Wynn's Black Silk, 5 lb. pail.....\$ 12¢
 Wynn's Black Silk, ½ doz. box, \$ doz. \$1.00
 Wynn's Black Silk, 5 oz. box, \$ doz. \$0.75
 Wynn's Black Silk, 8 oz. 1 lb., \$ doz. \$1.00

Poppers, Corn—

Round or Square.
 1 qt.....\$ doz. 60¢; \$ gr. \$8.00
 ½ qt.....\$ doz. 70¢; \$ gr. 7.50
 2 qt.....\$ doz. \$1.10; \$ gr. \$1.50
 Quincy Corn Popper, 1 qt., \$ gr.
 \$17.00; 2 qt., \$22.00.

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato*.

Pots—Glue—

Enameled.....40¢@10¢@50¢
 Tinned.....40¢@10¢@50¢

Powder—

In Canisters:
 Duck, 1 lb each.....45¢
 Fine Sporting, 1 lb each.....75¢
 Rifle, ½ lb each.....15¢
 Rifle, 1 lb each.....25¢
 In Kegs:
 Duck, 6½ lb kegs.....\$2.25
 Duck, 12½ lb kegs.....\$4.25
 Duck, 25 lb kegs.....\$8.00
 Rifle, 6½ lb kegs.....\$1.25
 Rifle, 12½ lb kegs.....\$2.25
 Rifle, 25 lb kegs.....\$4.00
 King's Smokeless:
 Keg (25 lb bulk).....\$20.00
 Half Keg (12½ lb bulk).....\$10.25
 Quarter Keg (6½ lb bulk).....\$5.25
 Canister (1 lb bulk).....\$0.40
 Case, 1 lb Canisters (50 lb
 bulk).....\$45.00
 Half Case, 1 lb Canisters (25
 lb bulk).....\$22.75
 King's Semi-Smokeless:
 Keg (25 lb bulk).....\$10.00
 Half Keg (12½ lb bulk).....\$5.25
 Quarter Keg (6½ lb bulk).....\$2.75
 One Pound Can, bulk.....\$0.50

Presses—

Fruit and Jelly—
 Enterprise Mfg. Co.....25¢@30¢

Pruning Hooks and Shears—See Shears.**Pullers Nail—**

Crown, \$ doz. \$18.00.....50¢
 Crown Prince, \$ doz. \$15.00.....50¢
 Giant, No. 1, \$ doz. \$18; No. 2, \$16.50;
 No. 3, \$15.....40¢
 National, \$ doz. \$24.00.....40¢

Slates—(From store).

"D" Slates.....50¢10¢10¢10¢5¢
Unexcelled Northless Slates, 60 and 10¢
Victor slates.....60 and eight 10¢ and 5¢

Slaw Cutters—See Cutters.**Snaps Harness—**

Covert Mfg. Co.:
Deroy.....45¢2¢
High Grade.....45¢2¢
Jockey.....45¢2¢
Trojan.....45¢2¢

Covert's Saddlery Works:

Banner.....75¢
Crown.....70¢
Triumph.....70¢

W. & E. T. Fitch:

Bristol.....40¢10¢
Empire.....50¢5¢
National.....50¢10¢5¢
Clipper.....40¢10¢
Champion.....60¢5¢
Victor.....50¢5¢5¢
German.....70¢10¢70¢10¢10¢
Sargent's Patent Guarded.....70¢10¢70¢10¢10¢

Snaths—

Scythe.....55¢

Snips, Tinner's—See Shears.**Soldering Irons—**

See Irons, Soldering.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—**Tinned Iron—**

Basting, Cen. Stamp Co.'s list, 75¢10¢80¢
Solid Table and Tea, Cen. Stamp Co.'s
list.....70¢25¢

Silver Plated—

Flat Ware.....60¢5¢60¢10¢5¢
Rogers & Brother.....60¢
C. Rogers & Bros.....60¢
Wm. Rogers Mfg. Co.....60¢

Miscellaneous—

German Silver.....60¢10¢
C. Rogers & Bros.:
18 per cent. German Silver.....60¢
18 per cent. Nickel Silver.....60¢
Silver Metal.....60¢10¢
Wm. Rogers Mfg. Co.:
18 German Silver.....60¢
Rogers' Silver Metal.....60¢10¢

Springs—**Door—**

Champion (Coll.).....50¢10¢50¢10¢10¢
Gem (Coll.).....20¢
Rubber, complete.....\$70. \$15.00
Star (Coll.).....\$3.95
Torrey's Rod, 39 in.....\$1.10¢1.25
Warner's No. 1, \$ doz. \$1.50, No. 2,
\$1.40.....55¢55¢10¢
Victor (Coll.).....60¢10¢60¢10¢5¢

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half
Scroll, 60¢10¢60¢10¢10¢10¢ or fol-
lowing net prices:

	Tempered	Oil Tempered
1 1/2 in. 5 1/2 ft. Bk. Bk.	6 1/2	6 1/2
1 1/2 in. 5 1/2 ft. Bk. Bk.	6 1/2	6 1/2
1 1/2 in. 5 1/2 ft. Bk. Bk.	6 1/2	6 1/2
1 1/2 in. 5 1/2 ft. Bk. Bk.	6 1/2	6 1/2
1 1/2 in. 5 1/2 ft. Bk. Bk.	6 1/2	6 1/2

Cliff's Bolster Springs.....40¢2¢
Cliff's Seat Springs.....\$ pair 45¢

Sprinklers, Lawn—

Enterprise.....25¢90¢
Philadelphia No. 1, \$ doz. \$12; No. 2,
\$15; No. 3, \$24.....85¢

Squares—

Nickel plated.....List May 1, '95
Steel and Iron.....75¢10¢80¢5¢
Rosewood Hdl. Try Square and T-Bevels
.....60¢10¢10¢70¢
Iron Hdl. Try Squares and T-Bevels
.....40¢10¢40¢10¢10¢
Dixon's Try Sq. and T-Bevels.....60¢10¢
Winterbottom's Try and Miter.....50¢10¢

Squeezers—**Lemon—**

Wood, Common, \$ gr. No. 0, \$5 00;
No. 1, \$6.50; No. 2, \$10.00.
Wood, Porcelain Lined, No. 1, \$ doz.
\$3.25¢3.50

Tinned Iron.....\$ doz. \$0.80¢1.25
Iron, Porcelain Lined, \$ doz. \$3.25¢3.50
Hotchkiss Straight Flash.....\$ doz. \$9.00
Jennings' Star.....\$ doz. \$1.85¢1.90
King.....\$ doz. \$2.00

Staples—

Barbed Blind, 1/4, 1/2 and 3/4 in. \$ 5¢/50¢
Fence Staples, Galvanized (Same price
Fence Staples, Plain).....\$ Bk Wire
Grand Crossing Tack Co.'s list.....75¢10¢

Steels, Butchers'—

Dick's.....40¢
Foster Bros.....40¢
C. & A. Hoffmann's.....40¢
Nichols Bros.....50¢
John Wilson's, list Sep. 1, '94.....25¢

Steelyards.....40¢40¢10¢**Stocks and Dies—**

Blacksmith's:
Butterfield's Goods.....35¢40¢
Waterford 1 Good.....35¢40¢
Gardner.....40¢10¢
Green River.....25¢
Lightning Screw Plate.....25¢
Little Giant.....25¢
Reese's New Screw Plates.....25¢30¢
Reversible Ratchet.....25¢

Stone—**Soythe Stones—**

Pike Mfg. Co., list '95-'96.....33¢4¢

Cleveland Stone Co., list Nov., '92, 89¢4¢**Oil Stones, &c.**

Pike Mfg. Co.:
Hindustan No. 1, \$ doz. \$8¢
Sand Stone.....5¢
Turkey Oil Stone, Extra.....80¢
5 to 3 in.....80¢
Turkey Slips.....\$2.00
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....30¢
Rosy Red Slips.....30¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5 in. \$2.50
Arkansas Stone, No. 1, 5 to 9 in. \$3.50

Tanite Mills:

Emery Oil, \$ doz. \$5.00.....50¢60¢

Stoners—**Cherry—**

Enterprise.....25¢30¢

Stops, Bench—

Cincinnati.....25¢10¢
Seymour Smith & Son, \$ doz. No. 1,
\$3.50; No. 2, \$3.20
Millers Falls.....15¢10¢
Morrill's.....\$11.00, 40¢20¢
Stearns.....30¢25¢
Tatum's.....40¢

Stops, Window—

Taplin's.....45¢

Stove Boards—

See Boards, Stove.

Stove Polish—See Polish, Stove.**Straps, Box—**

Cary's Universal.....20¢10¢10¢

Stretchers, Carpet—

Cast Iron, Steel Points.....\$ doz. 70¢75¢
Cast Steel, Polished.....\$ doz. \$2.25
Socket.....\$ doz. \$1.75
Bullard's.....25¢10¢40¢

Stuffers, Sausage—

Miles' Challenge, \$ doz. \$20.....50¢50¢5¢
Enterprise Mfg. Co., list Jan. 17, '93.....25¢25¢75¢
National Specialty Mfg. Co., list Jan.
1, '97.....25¢

Sweepers, Carpet—

Blissell:
Cosmopolitan, Cyco Bearing.....\$24.00
Criterion.....18.00
Furniture Protector, Japanned.....\$22.00
Furniture Protector, Nickel.....\$24.00
Gold Medal, Cyco Bearing.....\$24.00
Grand, Cyco Bearing.....\$36.00
Grand Rapids, Japanned.....\$22.00
Grand Rapids, Nickel.....\$24.00
Hall, Cyco Bearing.....\$60.00
Improved Crown Jewel, Jap'd.....\$19.00
Improved Crown Jewel, Nickel.....\$21.00
Improved Victor.....\$18.00
Popular.....\$14.00
Premier, Cyco Bearing.....\$24.00
Prize, Cyco Bearing.....\$24.00
Standard, Japanned.....\$20.00
Standard, Nickel.....\$22.00
Superior, Cyco Bearing.....\$24.00
Welcome, Cyco Bearing.....\$24.00
Toy Line: Misses', \$9; Little Jewel,
\$8; Little Queen, \$1.50; Child's, \$2.50;
Boy, \$2; Daisy, \$1.50.
Goshen:
Acme, Nickel.....\$24.00
Banner.....\$20.00
Champion.....\$17.00
Common Sense, Nickel.....\$24.00
Easy, Jap'd, \$ doz. \$20. Nickel, \$22.00
Gift Edge, Nickel.....\$24.00
Grand Republic (18 inch) Nickel.....\$33.00
Imperial, Nickel.....\$25.00
Ladies' Friend No. 1.....\$15.00
Ladies' Friend No. 2.....\$16.00
Little Pet.....\$6.00
Majestic, Nickel.....\$24.00
Model, Nickel.....\$24.00
Our Best, Nickel.....\$24.00
Our Leader.....\$18.00
Our Own, Nickel.....\$24.00
Rapid, Nickel.....\$22.00
Reliable.....\$30.00
Select, Nickel.....\$22.00
Star.....\$19.00
Toy.....\$15.00
Triumph.....\$19.00
Sweeperette:
No. 2, Oak, Jap'd.....\$18.00
No. 4, Special, Oak and Birch,
Silvered.....\$20.00
No. 4, Regular, Oak and Birch,
Nickel.....\$22.00
No. 6, Oak and Mahogany, Nick.....\$24.00
Diamond Medal.....\$27.00
Comfort.....\$24.00
Companion.....\$15.00
Sunbeam, Toy.....\$3.00
Dolly, Toy.....75¢

Tacks, Brads, &c.—

List Jan. 15, '99.

Carpet Tacks—
American Blued.....90¢99¢
American Tinned.....90¢40¢
American Cut Tacks.....90¢25¢
Swedes Iron Tacks.....90¢35¢
Upholsterers' Tacks.....90¢50¢
Gimp Tacks.....90¢50¢
Lace Tacks.....85¢10¢
Trimmers' Tacks.....90¢35¢
Looking Glass Tacks.....75¢
Bill Posters' and Railroad Tacks.....90¢35¢
Hungarian Nails.....80¢30¢
Common and Patent Brads.....75¢10¢
Trunk and Clout Nails:
Blued.....80¢10¢
Tinned.....80¢10¢

Miscellaneous—

Double Point Tacks.....90¢10¢90¢10¢10¢
Steel Wire Brads, R. & E. Mfg. Co.'s list
50¢10¢60¢
See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.00
Emerald, S. S. & Co.....60-gal. \$3.75
Queen City S. S. & Co., 60-gal. each, \$4.09;
100-gal. \$5.25; 120-gal. \$5.50; 200-
gal. \$14.00; 250-gal. \$17.75
Wilson's:
No. 9.....60¢10¢
Aztec, Force Pump.....60¢10¢
Cone Top, Measuring Pump.....60¢
Cabinet, Measuring Pump.....50¢
Gasoline Tanks.....60¢10¢

Tapes, Measuring—

American Assos Skin.....40¢10¢50¢
Patent Leather.....25¢25¢10¢
Steel.....33¢40¢
Chesterman's.....25¢25¢5¢
Keuffel & Esser Co., Steel and Metallic,
new list, 1898.....35¢
Lufkin's Steel and Metallic.....33¢40¢5¢

Thermometers—

Tin Case.....80¢10¢

Ties, Bale—Steel.

Standard Wire, list.....50¢10¢5¢

Ties, Wall—

Cleveland, Steel.....\$ 1000, \$10.00

Tinner's Shears, &c.—

See Shears, Tinner's, &c.

Tinware—

Stamped, Japanned and Pieced, sold
very generally at net prices.

Tire Benders, Upsetters,

&c.—See Benders and Upset-
ters, Tire.

Tobacco Cutters—

See Cutters, Tobacco.

Tools—**Coopers'—**

Shaves, Cincinnati Tool Co.....20¢
L. & J. White.....20¢20¢5¢

Saw—

Atkins' new list.....40¢
Simonds'.....33¢4¢

Transom Lifters—

See Lifters, Transom.

Traps—Game—

Newhouse.....50¢50¢10¢
Oneida Pattern.....80¢80¢5¢
Sensible.....83¢33¢10¢

Mouse and Rat—

Dandy.....\$ doz. \$1.75
Marty French Rat and Mouse Traps
(Genuine):
No. 1, Rat.....\$ doz. \$15.00
No. 3, Rat.....\$ doz. \$5.85
No. 3 1/2, Rat.....\$ doz. \$4.50
No. 4, Mouse.....\$ doz. \$4.30
No. 5, Mouse.....\$ doz. \$3.00
Hotchkiss Metallic Mouse, 5-hole traps,
\$ doz. 6 1/2; in full cases, \$ doz. 60¢
Hotchkiss Imp. Rat Killer.....\$ gr. \$12.50
Hotchkiss New Rat Killer.....\$ gr. \$12.50
Mouse, Wood, Choker, \$ doz. holes, 8¢9¢
Mouse, Round Wire, \$ doz. \$1.50.....10¢
Mouse, Sensible.....33¢4¢
Rat, Decoy, \$ gr. \$10.00.....10¢
Rat, Sensible.....33¢4¢
Schuyler's Rat Killer, No. 1, \$ gr. \$15.00
No. 2, \$ gr. \$15.00

Fly—

Balloon, Globe or Acme.....\$ doz. \$1.25; \$ gr. \$13.50
Harper, Champion or Faragon.....\$ doz. \$1.75; \$ gr. \$16.50

Triers—

Butter and Cheese.....25¢

Trimmers, Spoke—

Bonney's No. 1, \$ doz. \$3.75; No. 2,
\$3.75
Cincinnati.....25¢10¢
Douglas, \$ doz. \$9.00.....30¢
Stearns.....20¢10¢

Trowels—

Garden.....70¢
Dixons' Brk and Plastering.....25¢25¢10¢
Peace's Plastering.....25¢25¢5¢
Rose Brick and Plastering.....30¢30¢10¢
Woodrough & McParlin, Plastering.....25¢10¢

Trucks, Warehouse, &c.—

R. & L. Block Co.'s list.....40¢
Daisy Stove Trucks, Improved pattern
\$ doz. \$18.00

Tubs, Wash—

	No. 1	2	3
Galvanized, \$ doz. \$4.00	50	50	50
Galvanized S. S. & Co., with Wringer	Attachment, \$ doz. No. 10, \$6.25;		
No. 20, \$6.75; No. 30.....\$7.50			

Twine—**Blinder—**

White S. 500 feet to D.....87¢
Standard 500 feet to D.....87¢
Manila, 600 feet to D.....95¢
Pure Manila, 650 feet to D.....10¢

Miscellaneous—

	BC.	B.
No. 9, 1/4 and 1/2 Bails.....90¢	24¢	
No. 12, 1/4 and 1/2 Bails.....17¢	20¢	
No. 18, 1/4 and 1/2 Bails.....14¢	17¢	
No. 24, 1/4 and 1/2 Bails.....14¢	17¢	
No. 30, 1/4 and 1/2 Bails.....13¢	16¢	
One Line, Cotton, 1/4 Bails.....15¢20¢		
Cotton Mops, 8, 9, 12 and 15 B to C.....8¢		

Cotton Wrapping, 5 Balls to D.....9¢10¢
American 2-Ply Hemp, 1/4 and 1/2 Bails.....9¢10¢
American 3-Ply Hemp, 1 B Bails.....9¢10¢
American 3-Ply Hemp, 1 B Bails (Spring
Twine).....10¢11¢
India 2-Ply Hemp, 1/4 and 1/2 B Bails
(Spring Twine).....8¢
India 3-Ply Hemp, 1 B Bails.....8¢
India 3-Ply Hemp, 1 1/2 B Bails.....7¢7 1/2¢
2 B, 4 and 5-Ply Jute, 1/2 B Bails.....6¢
Mason Line Linen, 1/2 B Bails.....4¢
No. 264 Mattress, 1/4 and 1/2 B Bails.....3¢4¢
Wool.....5¢5 1/2¢

Vises—

Solid Box.....60¢10¢60¢10¢5¢

Parallel—

Bonney's.....50¢5¢
Fisher & Norris Double Screw.....15¢10¢
Hollands'.....40¢40¢10¢
Massey's Perfect.....20¢25¢
Massey's Clincher.....40¢40¢10¢
McMill's.....25¢
Miller's Falls.....45¢10¢
Parker's.....20¢25¢
Parker's Oval Slide.....50¢10¢
Parker's Victor.....30¢
Prentiss.....20¢25¢
Sargent's.....70¢10¢70¢10¢10¢
Simpson's Adjustable.....40¢
Stephens'.....25¢90¢
Toles' Woodworking.....40¢5¢40¢10¢
Trenton.....40¢5¢40¢10¢

Saw Filers—

Bonney's, Nos. 2 & 3, \$15.00.....50¢10¢
Cincinnati.....25¢10¢
Reading.....40¢10¢
Stearns' Comm., Nos. 0, 1, 2 & 3.....50¢
Stearns' Rubber Jaw, Nos. 10 & 33, 33¢4¢
Wentworth's Rubber Jaw, Nos. 1, 2
and 3.....40¢

Miscellaneous—

Signal & Keeler Combination Pipe
Vise.....60¢5¢

Parker's Combination Pipe:

87 Series.....60¢
187 Series.....80¢5¢
No. 870.....40¢

Wads—Price Per M.

	U. M. C. & W. R. A.—R. E., 11 up.....	60¢
U. M. C. & W. R. A.—R. E., 10.....	70¢	
U. M. C. & W. R. A.—R. E., 9.....	80¢	
U. M. C. & W. R. A.—R. E., 8.....	80¢	
U. M. C. & W. R. A.—R. E., 7.....	80¢	
U. M. C. & W. R. A.—R. E., 6.....	80¢	
U. M. C. & W. R. A.—R. E., 5.....	80¢	
U. M. C. & W. R. A.—R. E., 4.....	80¢	
U. M. C. & W. R. A.—R. E., 3.....	80¢	
U. M. C. & W. R. A.—R. E., 2.....	80¢	
U. M. C. & W. R. A.—R. E., 1.....	80¢	
Ely's B. E., 11 and larger.....	\$1.70¢1.75	
Ely's P. E., 12 to 20.....	\$3.00¢3.25	

Wagon Boxes—

See Boxes, Wagon.

Wagon Jacks—

See Jacks, Wagon.

Ware, Hollow—**Aluminum—**

S. S. & Co. Reduced List.....40¢

Cast Iron, Hollow—

Stove Hollow Ware—
Ground.....60¢10¢60¢10¢10¢
Unground.....70¢5¢70¢10¢
White Enameled Ware—
Mashin Kettles.....75¢10¢5¢80¢
Boilers and Saucepans.....60¢80¢5¢
Tinned Boilers and Spans.....60¢25¢

Enameled—

Agate and Granite Ware, list Jan. 1,
'94, revised Jan. 2, '95.....40¢10¢
Second Quality.....70¢10¢70¢10¢10¢
Ironclad Enameled Ware, Old list.....70¢
Never Break Enameled.....50¢10¢

Kettles—

Galvanized Tea Kettles—
Inch.....6 7 8 9
Each.....40¢ 45¢ 50¢ 55¢

Steel Hollow Ware.

Avery Spiders & Griddles.....70¢70¢10¢
Avery Kettles.....60¢60¢10¢
Never Break Spiders and Griddles.....70¢70¢10¢

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CURRENT METAL PRICES.

MARCH 15, 1899.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢; Square, 0.8¢	
1 to 2 in. round and square	1.50¢ @ 1.60¢
1 to 6 in. x 1/4 to 1 in.	
Refined Iron:	
1 to 2 in. round and square	1.60¢ @ 1.70¢
1 to 4 in. x 1/4 to 1 in.	
4 1/2 to 6 in. x 1/4 to 1 in.	1.80¢ @ 1.90¢
1 to 6 in. x 1/4 and 5-16	
Angles	1.70¢
Tees	2.00¢
Beams	2.00¢
Channels	2.00¢
Std. 4-1/2 and 11-16 round and sq.	1.70¢ @ 1.80¢
Bands—1 to 6 x 3-16 to No. 12	1.95¢ @ 2.20¢
"Burden's Best" Iron, base price	2.50¢
Burden's "H. B. & S. Iron, base price	2.90¢
"Clister"	2.50¢
Norway Bars	3.75¢
Norway Shapes	3.75¢ @ 4.00¢

Merchant Steel from Store—

Open Hearth and Bessemer Machinery	1.70 to 1.80¢
Toe Calk, Tire and Sleigh Shoe	1.90 to 2.00¢
Best Cast Steel, base price in small lots	7¢
Best Cast Steel Machinery, base price in small lots	8¢

Soft Steel Sheets—

1/4 inch	2.10¢	No. 14	2.30¢
3/16 inch	2.15¢	No. 16	2.35¢
No. 8	2.20¢	No. 18	2.45¢
No. 10	2.20¢	No. 20	2.55¢
No. 12	2.25¢	No. 22	2.65¢

Sheet Iron from Store.

Black.

	Common	R. G. Cleaned
	American	American
Nos. 10 to 16	2.30¢	2.50¢
Nos. 17 to 21	2.40¢	2.60¢
Nos. 22 to 24	2.50¢	2.70¢
Nos. 25 and 26	2.60¢	2.80¢
No. 27	2.70¢	2.90¢
No. 28	2.80¢	3.00¢

Russia, Planished, &c.

Genuine Russia, according to assortment	10 1/2¢
Patent Planished	8 1/2¢
Patent Planished Sheet Steel	8 1/2¢

Galvanized.

	B. B.
Nos. 10 to 16	12¢
Nos. 17 to 21	13¢
Nos. 22 to 24	14¢
Nos. 25 to 26	15¢
No. 27	16¢
No. 28	17¢
No. 29	18¢
No. 30	19¢
30 in. 1¢ higher.	20¢

Foreign Steel from Store—

Best Cast	14¢
Extra Cast	16¢
Swaged Cast	16¢
Best Double Shear	16¢
Blister, 1st quality	12¢
German Steel, Best	10¢
2d quality	9¢
3d quality	8¢
Sheet Cast Steel, 1st quality	14¢
2d quality	13¢
3d quality	11¢
El. Mushet's "Special"	40¢
" " " " " " " "	75¢
" " " " " " " "	19¢
Hobson's Choice XX Extra Best	35¢
Jessop Self Hardening	40¢
Seamans' "Nelson" Steel	40¢
Hobson Self Hardening	40¢

METALS—

Tin—

Duty—Pigs, Bars and Block. Free.	Per lb.
Glance, Pigs	20 1/2¢
Straits, Pigs	23 1/2¢
Straits in Bars	20 1/2¢

Tin Plates—

American Charcoal Plates.

Standard Grade:	
IX, 14 x 20	5.25¢ @ 5.50
IX, 14 x 20	7.75¢ @ 8.00
Melvin Grade:	
IX, 14 x 20	5.75¢ @ 6.00
IX, 14 x 20	7.00¢ @ 7.25
Alhway Grade:	
IX, 14 x 20	5.00¢ @ 5.25
IX, 14 x 20	6.00¢ @ 6.25

American Coke Plates—Bright—

IX, 14 x 20	108¢
IX, 14 x 20	84.50
IX, 14 x 20	6.40
IX, 14 x 20	6.05

American Terne Plates—

IX, 20 x 28	8.50
IX, 20 x 28	10.00 @ 11.00

Tin Boiler Plates, American—

XXX, 14 x 26	112 sheets	\$10.50
IX, 14 x 28	112 sheets	11.45
IX, 14 x 31	112 sheets	12.65

Copper—

Duty: Pig, Bar and Ingot and Old Copper free	
Manufactured, 2 1/2¢ per lb.	

Ingot—

Lake	19¢
Amsonia trade casting	18 1/2¢

Sheet and Bolt—

February 2, 1899.

Prices, in cents per pound.

Sheet 1/4 to 5/16.

Not wider than	Not longer than	And longer than	64 oz. & over, galb. sheet, 30 x 60 and heavier.	30 oz. to 64 oz. 95 to 90 lb.	24 oz. to 30 oz. 18 1/2 to 85 lb.	16 oz. to 24 oz. 14 to 15 1/2 lb.	14 oz. and 14 lb. 12 1/2 to 12 1/2 lb.	12 oz. and 12 lb. 11 to 11 lb.	10 oz. and 10 lb. 9 1/2 to 9 1/2 lb.	8 oz. and 8 lb. 7 1/2 to 7 1/2 lb.	6 oz. and 6 lb. 5 1/2 to 5 1/2 lb.	4 oz. and 4 lb. 3 1/2 to 3 1/2 lb.	Lighter than 4 oz.
1/4 in.	1/4 in.	1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3/16 in.	3/16 in.	3/16 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
1/2 in.	1/2 in.	1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3/4 in.	3/4 in.	3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
1 in.	1 in.	1 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
1 1/4 in.	1 1/4 in.	1 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
1 1/2 in.	1 1/2 in.	1 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
1 3/4 in.	1 3/4 in.	1 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
2 in.	2 in.	2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
2 1/4 in.	2 1/4 in.	2 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
2 1/2 in.	2 1/2 in.	2 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
2 3/4 in.	2 3/4 in.	2 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3 in.	3 in.	3 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3 1/4 in.	3 1/4 in.	3 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3 1/2 in.	3 1/2 in.	3 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
3 3/4 in.	3 3/4 in.	3 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
4 in.	4 in.	4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
4 1/4 in.	4 1/4 in.	4 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
4 1/2 in.	4 1/2 in.	4 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
4 3/4 in.	4 3/4 in.	4 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
5 in.	5 in.	5 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
5 1/4 in.	5 1/4 in.	5 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
5 1/2 in.	5 1/2 in.	5 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
5 3/4 in.	5 3/4 in.	5 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
6 in.	6 in.	6 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
6 1/4 in.	6 1/4 in.	6 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
6 1/2 in.	6 1/2 in.	6 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
6 3/4 in.	6 3/4 in.	6 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
7 in.	7 in.	7 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
7 1/4 in.	7 1/4 in.	7 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
7 1/2 in.	7 1/2 in.	7 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
7 3/4 in.	7 3/4 in.	7 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
8 in.	8 in.	8 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
8 1/4 in.	8 1/4 in.	8 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
8 1/2 in.	8 1/2 in.	8 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
8 3/4 in.	8 3/4 in.	8 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
9 in.	9 in.	9 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
9 1/4 in.	9 1/4 in.	9 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
9 1/2 in.	9 1/2 in.	9 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
9 3/4 in.	9 3/4 in.	9 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
10 in.	10 in.	10 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
10 1/4 in.	10 1/4 in.	10 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
10 1/2 in.	10 1/2 in.	10 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
10 3/4 in.	10 3/4 in.	10 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
11 in.	11 in.	11 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
11 1/4 in.	11 1/4 in.	11 1/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
11 1/2 in.	11 1/2 in.	11 1/2 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
11 3/4 in.	11 3/4 in.	11 3/4 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2
12 in.	12 in.	12 in.	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2	21 1/2